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# Artificial Intelligence: A Rights-Based Blueprint for Business

## Paper 2: Beyond the Technology Industry



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## About This Report

This report was written by Dunstan Allison-Hope (Managing Director, BSR) and Mark Hodge, an independent business and human rights expert.

Artificial Intelligence (AI) technologies—and the big data business models underpinning them—are disrupting how we live, interact, work, do business, and govern. The economic, social, and environmental benefits of AI could be significant. But as evidence mounts about potential negative consequences for society and individuals, we urgently need a robust view of what responsible conduct looks like and a vision for how markets and governance mechanisms can guide the right behaviors.

We believe that the speed, complexity, and extensive reach of AI requires an approach to responsible practice that is rights-based. In three papers we draw upon approaches and lessons learned from the field of business and human rights to describe a blueprint for responsible business practice both within and beyond the technology sector.

Deliberate investment in rights-based approaches is urgently needed to avoid two risks: First, that new technologies, capabilities, and business models are unleashed into the world that cause significant harm to the rights to which all human beings are inherently entitled; and second, that a once-in-a-generation opportunity to harness massive advances in technology for the public good is missed.

This is the second of three working papers intended to develop and test new business policies and practices aimed at establishing a sustainable social license to operate for new AI technologies that are capable of creating long-term sustainable value for all stakeholders.

- » In the first paper we outline 10 beliefs—built on the internationally agreed-upon foundations of the business and human rights field—to govern and guide the use of AI. We draw heavily on the *United Nations Guiding Principles on Business and Human Rights* (UNGPs), the foundational and internationally endorsed road map for addressing business human rights impacts on people.
- » This second paper argues for attention to be paid to the AI value chain and demonstrates that the positive and negative human rights impacts associated with AI are directly relevant for companies beyond the technology sector.
- » The third paper explores what tools, methodologies, and guidance exist or will need to exist to operationalize business respect for human rights in the context of AI development and use.

These three papers have been based on a mixture of desk-based research and direct experience by the authors engaging with business on human rights due diligence. They are positioned as “working papers” to stimulate discussion and influence the ongoing debate. The authors welcome feedback, comment, and dialogue on the papers, and we look forward to working with others to shape the next iteration of these ideas.

Please direct comments or questions to [web@bsr.org](mailto:web@bsr.org).

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# Introduction

Artificial Intelligence (AI) can be defined as intelligence exhibited by machines. It includes both “machine learning” (an approach to achieve AI), which uses algorithms to parse data, learn from it, and then make a determination or prediction, and “deep learning” (a technique for implementing machine learning), which is inspired by understanding the biology of our brains.

AI is advancing rapidly, thanks to ever-more-powerful computing, massive growth in the availability of digital data, and increasingly sophisticated algorithms. These advances bring enormous opportunities to address big social challenges, such as improved health diagnostics, self-driving vehicles that improve road safety, and enhanced fraud prevention, to name just three. AI also brings social risks, including new forms of discrimination arising from algorithmic bias, labor impacts arising from the displacement of workers by machines, increased potential of surveillance by employers and the State using tracking devices and facial recognition tools, and new risks to child rights as the volume of data collected about children increases substantially.

On the one hand, technology firms driving and promoting AI should be at the forefront of efforts to address the social, ethical, and human rights issues arising from the use of AI. On the other hand, it is easy to overlook the fact that **every industry** will in some way be involved in any societal harms that come from the use of AI, and so they also have a role to play in ensuring the responsible development and use of AI. Almost every company is a technology company now, and AI is transforming the product, service, and technology road maps at companies everywhere. Companies in mining, agriculture, healthcare, retail, financial services, or transportation are exploring how AI can be turned into innovative customer solutions, new business models, and massive operational efficiencies.

For these reasons, we believe that human rights teams and decision-makers in non-technology companies will need to rapidly improve their knowledge about how to undertake human rights due diligence in the age of AI. This paper seeks to support these business leaders and their stakeholders to begin addressing human rights impacts, risks, and opportunities associated with how they use AI. The paper is structured into three sections:

- » **Understanding the evolving AI value chain:** Part one offers a high-level overview of the fast-moving AI value chain by introducing some of the different actors and AI applications being used in diverse industries. Lack of clear understanding of the nature and complexity of value chains can undermine efforts to embed responsible practice and seek accountability for harms. For businesses, this can lead to partial or ineffective management of risks and opportunities.
- » **A summary of AI opportunities and risks in diverse sectors:** Part two provides an illustration of AI use and associated human rights issues in six industries: Financial Services; Healthcare; Retail; Transport and Logistics; Agriculture; and Extractives. We end this section with an overview of how AI is already being used in the context of human resources and workplace management, a reality that all companies in all industries will clearly need to address.
- » **Initial steps for non-technology companies:** The final section offers areas that we believe businesses in all industries should consider as they set out to identify and assess the human-rights-related risks and opportunities that AI might present to their business.

# Understanding the Evolving AI Value Chain

Understanding the value chain of a given product or service all the way from raw materials to consumer use and beyond is now a critical part of the responsible business agenda. Consider, for example, the 1990s revelation that child labor was being used to sew footballs in Pakistan; banks making transparent the human rights issues throughout the value chain of commodities, such as palm oil and gold; the engagement of electronics companies in addressing financial flows to armed groups related to the sale of conflict minerals; and the efforts to map the actors and financial flows that sustain modern-day slavery.

Global value chains are increasingly complex and forever morphing, and it can be challenging to establish what companies—and other actors such as investors and States—should be doing to meet their own policy commitments and societal expectations. For this reason, a good understanding of value chains can enable companies and their stakeholders to focus resources and interventions where they will make the biggest positive difference to people who are affected by business operations, products, and services.

We believe that understanding the AI value chain must be part of designing strategies and tactics for addressing the actual and potential human rights impacts of AI. We also believe that doing so now, as the AI landscape is being created, offers opportunities to instill responsible behavior early on, rather than scrambling and struggling to address risks once they are locked in.

## A SIMPLE OVERVIEW

It is not easy to grasp the plethora of new technologies and investments being made to capitalize on the growth in AI, and even harder to keep track of the various actors who are, or will be, involved in the chain. Here we offer a simplified overview to support discussion and joint learning.

- » **Large technology companies:** The world's largest technology firms are investing billions of dollars in R&D and acquisitions in an attempt to lead the AI field. The seven firms most involved in AI—Apple, Alphabet, Microsoft, Amazon, Tencent, Alibaba, and Facebook—are also among the 10 largest companies in the world based on market value. Many large technology companies are actively participating in initiatives to address the social impacts of AI (such as the Partnership on AI), and industry bodies and associations have published principles for ethics and artificial intelligence, including the Information Technology Industry Council (ITI),<sup>1</sup> the Software and Information Industry Association (SIIA),<sup>2</sup> and the Institute of Electrical and Electronics Engineers (IEEE).<sup>3</sup>
- » **Technology start-ups:** Many start-ups focusing on specific areas such as facial recognition, credit checks, advertising, autonomous vehicles, and recruitment add to the wide array of innovators. A mapping of the 50 largest AI start-ups in the world (by funds raised), published in 2017 by Fortune Magazine,<sup>4</sup> shows start-ups across 14 product and service categories, including Business Intelligence and Analysis, Cybersecurity, Fintech, Robotics, Conversational AI/Bots, and Text

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<sup>1</sup> <https://www.itic.org/public-policy/ITIAIPolicyPrinciplesFINAL.pdf>

<sup>2</sup> <http://www.siaa.net/Portals/0/pdf/Policy/Algorithmic%20Fairness%20Issue%20Brief.pdf?ver=2016-11-04-125255-670>

<sup>3</sup> <https://ethicsinaction.ieee.org/>

<sup>4</sup> <http://fortune.com/2017/02/23/artificial-intelligence-companies/>

Analysis/Generation. The vast majority of the 50 companies (39) were in the United States, with the remaining 11 located in the United Kingdom, France, Israel, Taiwan, and China.

- » **Data brokers:** Data are the commodity at the heart of AI solutions. The insights generated by AI—often about our individual habits, preferences, and attitudes—are valuable for any actor with a stake in how we allocate attention, money, and even our votes. They are also instrumental in supporting those trying to aid us by protecting us from fraud and identify theft, or by enabling us to be connected to people, ideas, and opportunities that could enrich our lives. Data brokers buy and sell information about us from the mundane (such as name, age, height, and weight) to the sensitive (such as birth dates of everyone in our household and social security numbers) to the potentially disquieting (such as what we post online, political leaning, or preferred vacation destinations).
- » **Investors:** While a vast amount of investment in AI is coming from the seven large technology companies, firms working on AI are also receiving substantial venture capital (VC) and private equity funding. According to McKinsey, “the entrepreneurial activity unleashed by these developments drew three times as much investment in 2016—between US\$26 billion and US\$39 billion—as it did three years earlier.”<sup>5</sup> CB Insights, an investment intelligence firm, reported 397 AI deals in 2015, up from 67 in 2011, with the total amount of disclosed investments at US\$2.3 billion, up from US\$280 million in 2011.<sup>6</sup> The same report also lists the most active VC investors in this time frame, including Khosla Ventures, Intel Capital, Data Collective, Google Ventures, GE Ventures, Samsung Ventures, and Bloomberg Beta.
- » **Universities:** A large amount of research, development, and innovation for AI is taking place on university campuses around the world. Some of this is being funded by technology companies, while in other cases the State is leading the way. In April 2018 China’s Ministry of Education announced a five-year plan, to be led out of Peking University, to train 500 teachers and at least 5,000 students in AI.<sup>7</sup> This funding mix presents both questions and opportunities for embedding responsibility at the heart of AI technologies from their inception. For example, how can university research institutes retain the necessary independence from funders to develop tools that will deliver maximum public good, not just private gain? Can universities diversify the pool of experts building AI solutions to include, for example, more women and ethnic minorities?

## BEYOND TECH TO THE USERS OF AI

Among the headlines about AI it is easy to miss the fact that **every industry will in some way be involved—and implicated—in any societal harms that come with the use of AI.** This is because, as noted in the summer 2018 issue of MIT Technology Review, “AI is what economic historians consider a *general-purpose technology*. These are inventions like the steam engine, electricity, and the internal combustion engine. Eventually they transformed how we lived and worked. But businesses had to be reinvented...”<sup>8</sup>

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<sup>5</sup> [www.mckinsey.com/business-functions/mckinsey-analytics/our-insights/how-artificial-intelligence-can-deliver-real-value-to-companies](http://www.mckinsey.com/business-functions/mckinsey-analytics/our-insights/how-artificial-intelligence-can-deliver-real-value-to-companies)

<sup>6</sup> [www.cbinsights.com/research/artificial-intelligence-funding-trends-q216/](http://www.cbinsights.com/research/artificial-intelligence-funding-trends-q216/)

<sup>7</sup> [www.opengovasia.com/articles/chinas-ministry-of-education-issues-action-plan-on-promoting-ai-in-universities](http://www.opengovasia.com/articles/chinas-ministry-of-education-issues-action-plan-on-promoting-ai-in-universities)

<sup>8</sup> [www.technologyreview.com/s/611482/the-productivity-paradox/](http://www.technologyreview.com/s/611482/the-productivity-paradox/)

Almost every company is a technology company now, and AI is transforming the product, service, and technology roadmaps at companies everywhere. Companies in mining, agriculture, healthcare, retail, financial services, or transportation are exploring how AI can be turned into innovative customer solutions, new business models, and massive operational efficiencies.

Some have tried to estimate the business opportunity that integration of AI solutions represents. For example, based on analyzing the application of neural network techniques in 400 use cases across 19 industries, an April 2018 McKinsey report estimates that in the next 20 years the “total annual value potential of AI alone across 19 industries and in the global economy came to between US\$3.5 trillion and US\$5.8 trillion.” To put this into real-world perspective, the report notes that “even the industry with the smallest potential value at stake, aerospace and defense (less than US\$50 billion), could enable the annual creation of value that is equivalent to the GDP of Lebanon.”<sup>9</sup>

It is helpful to remain sober about the pace of change. The rate of uptake and integration of AI will differ by industry, and in some cases we are a long way from widespread AI integration. For example, the same McKinsey report ranks 13 industries using an “AI Index,” which considers the rate of adoption across three areas: Assets (including Depth of AI technology and AI Spend); Usage (in product development, operations, supply chain/distribution, customer experience, financial management, and workforce management), and Labor (addressing AI use by the workforce). At the top of the list are high-tech and telecommunications, automotive and assembly, and financial services. Halfway down are transportation and logistics, retail, and education. At the bottom are healthcare, building materials and construction, and travel and tourism. Note that for those lower down the list, the correct response is not that the human rights impacts, risks, and opportunities of AI are not salient today—the correct conclusion is that there is a narrowing window to “get out in front” of addressing future developments.

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[www.mckinsey.com/~media/mckinsey/industries/advanced%20electronics/our%20insights/how%20artificial%20intelligence%20can%20deliver%20real%20value%20to%20companies/mgi-artificial-intelligence-discussion-paper.ashx](http://www.mckinsey.com/~media/mckinsey/industries/advanced%20electronics/our%20insights/how%20artificial%20intelligence%20can%20deliver%20real%20value%20to%20companies/mgi-artificial-intelligence-discussion-paper.ashx)

## AI Impacts in Diverse Sectors

The human rights impacts, risks, and opportunities of AI will vary significantly among industries—and even among companies within the same industry, depending on their business model—and require in-depth study. In this section we:

- Summarize some of the main uses of AI in six industries and the potential human rights impacts, risks, and opportunities arising from the use of AI.
- Provide an overview of how AI is already being used in the context of human resources and workplace management—a reality that all companies in all industries will need to address in their own operations and supply chains.

We believe it is important for companies in all industries to confront these realities now. In the same way that large apparel brands are held responsible for exploitative labor practices in the supply chain or that extractive companies are held accountable for abuse by third-party security providers, companies buying and using AI will to some degree be held responsible for any AI-enabled human rights harms that they are involved in, even if they are simply buying and using technology from a third party.

## FINANCIAL SERVICES

The use of AI by the financial services industry will bring human rights implications in areas like nondiscrimination, responsible investment, and privacy.

For example, the use of algorithms to inform decision-making about clients (such as whether to provide access to credit and at what rate) runs the risk of perpetuating, exacerbating, or masking discrimination and may result in discriminatory outcomes based on gender, race, income, nationality, or other status. Conversely, there are significant opportunities to design AI in ways that overcome human bias by scrutinizing data sets used in machine learning, for example.

The use of AI for trading, analysis, and advisory services will impact employment opportunities in the financial services industry and may disproportionately affect vulnerable groups with job displacement.

The impact of AI on the human rights risk profile of companies that financial services companies invest in, finance, or advise also brings human rights implications for the sector. For example, investing in companies involved in the research, development, and deployment of AI, such as through asset management or private finance, will raise new questions for responsible investment, “know your customer” controls, and investment due diligence. Knowledge about how AI is used will become strikingly relevant for the ability of financial services companies to adhere to the Equator Principles,<sup>10</sup> the Principles for Responsible Investment,<sup>11</sup> and the UNEP FI Principles for Sustainable Insurance.<sup>12</sup>

The relevance of AI to the human rights impact of financial services companies will vary according to segment, such as retail and private banking, corporate and investment banking, and asset management.

Below is a summary of the relevance of AI, and the human rights issues arising from it.

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<sup>10</sup> <http://equator-principles.com/>

<sup>11</sup> [www.unpri.org/](http://www.unpri.org/)

<sup>12</sup> [www.unepfi.org/psi/](http://www.unepfi.org/psi/)

## Relevance of Artificial Intelligence

- » **Decision-Making:** Use of algorithms to inform decision-making about clients, such as whether to provide access to credit and at what rate, or pricing insurance products according to an increasingly sophisticated understanding of risk.
- » **Operations and Management:** Using AI for internal reasons, such as hiring, performance management, trading, analysis, and advisory services.
- » **Service Delivery:** Providing corporate banking, advisory, and investment services to companies involved in the research, development, and deployment of AI.
- » **Ownership:** Investing in companies involved in the research, development, and deployment of AI, such as through asset management or private finance.
- » **Research:** Use of machines rather than humans for research.

## Examples of Human Rights Issues

- » **Nondiscrimination (Customers):** As decisions about credit and insurance are approved or denied by algorithms, financial models have the potential to perpetuate, exacerbate, or mask discrimination. Poorly created algorithms may create discriminatory outcomes (such as those based on gender, race, income, nationality, or other status), even if such discrimination is unintended—conversely, there are opportunities to design algorithms that overcome human bias.
- » **Nondiscrimination (Employees):** Use of algorithms in short-listing and hiring may unintentionally discriminate based on gender, race, income, nationality, or other status. Vulnerable groups may be disproportionately impacted by job displacement as AI is used for analysis previously undertaken by humans.
- » **Know Your Customer:** If financial services companies lack knowledge of AI, they may miss human rights impacts during customer due diligence processes.
- » **Responsible Investment:** AI creates entirely new dimensions for responsible investment—opportunities to proactively invest in companies developing AI for a positive social purpose, while screening for risks that AI is deployed for harm, such as in autonomous weapons systems or other controversial uses. Technology is not often considered to be a high-risk sector, but that may need to change.
- » **Privacy:** The harvesting and use of large amounts of data for analysis increases privacy risks.

## HEALTHCARE

There are significant opportunities to deploy AI in the healthcare industry in ways that have immensely positive impacts on human rights.

For example, the use of AI in treatment plans, connected health, and patient monitoring will positively influence the right of every human being to the enjoyment of the highest attainable standard of physical and mental health, and the right of everyone to a standard of living adequate for the health and well-being of oneself and one's family.

The use of AI in the healthcare industry will bring human rights risks too. For example, when AI is deployed in diagnostics and research and development, risks will exist in the areas of privacy, informed consent, and ensuring that patients provide proper permission for data use in trials and research. The deployment of AI may also open a new dimension of health inequality, and it will be important to ensure that the benefits of AI in healthcare are widely and equitably realized.

The relevance of AI to human rights in the healthcare industry will vary across the sector—for example, among healthcare providers, drug and medical device manufacturers, payers, insurers, and distributors.

## Relevance of Artificial Intelligence

- » **Treatment Plans and Personalized Medicine:** Using AI to provide more effective evidence-based treatment plans and learn which types of treatments will be most effective for different patients.
- » **Optimizing the Clinical Process with Personal Connected Health:** Using personal electronic devices, digital assistants, chat bots, and natural language processing to provide more personalized healthcare services.
- » **Diagnostics:** Mining medical records (and other sources, such as personal devices and social media activity) to provide early and more precise diagnosis and providing physicians with the information they need to make good decisions.
- » **Patient Monitoring and Assistance:** Using AI-based systems to monitor patients and help people make more informed and healthy lifestyle decisions.
- » **Personal and Connected Health:** Using technology to provide healthcare remotely and help patients better self-manage their care.
- » **Precision Medicine:** Identifying patterns in huge data sets of genetic information and medical records to find mutations and linkages to disease.
- » **Research and Development:** Analyzing gigantic volumes of data from various sources to speed up drug development and other forms of medical research.
- » **Connected Healthcare Systems:** Using big data and connected machines and devices to integrate and streamline healthcare delivery.

## Examples of Human Rights Issues

- » **Right to Health:** Reducing health disparities and vulnerability to health impacts by increasing access to information, analysis, and patient guidance.
- » **Privacy and Confidentiality:** Ensuring that highly sensitive, personal, and confidential information is kept secure and only used for the intended purpose as dictated by the patient, data controller, and healthcare provider. For example, ensuring that personal information is not used for advertising or other commercial purposes. This will require robust data stewardship policies, processes, and procedures.
- » **Informed Consent:** Requiring that patients provide proper consent (for example, for data use in clinical trials) and can participate in decision-making about their treatment plans.
- » **Access:** Ensuring that the benefits of AI in healthcare are widely and equitably realized among all patient populations, regardless of social and economic status, geography, ethnicity, race, gender, or other characteristic.
- » **Discrimination:** The use of data analytics, improved diagnostics, and personalized health knowledge to increase insurance costs for those at greatest risk.
- » **Health Systems Transformation:** Utilizing the opportunity for AI systems to provide high-quality, efficient, and coordinated care at a reduced cost.

## RETAIL

The retail industry is making significant use of AI across its entire value chain—including product design, product functionality, manufacturing, checkout, targeted advertising, store design, and distribution—resulting in a diverse range of positive and negative human rights impacts.

For example, targeted advertising based on criteria such as ethnicity, race, or gender can have both beneficial and adverse impacts, while the automation of manufacturing, distribution, and checkout will have a significant impact on jobs, employment, and labor rights. The use of AI in consumer products, such as children's toys, home robots, and digital assistants, have the potential to improve quality of life, but the collection of vast amounts of consumer data also raises the prospect of increased data requests and demands from law enforcement agencies, akin to those received by internet and telecommunications companies today.

The rights of children require special attention when considering the deployment of AI in the retail industry. The use of behavioral targeting and other AI-enabled advertising techniques have the potential to undermine children's privacy and put them at risk of manipulation, while the monitoring of children's use of online services can lead to advertisers using children for monetary gains without their informed consent.

The relevance of AI to human rights in the retail industry mostly arises from increased targeting and automation, as well as from the use of AI to improve the functionality of consumer products. Risks and opportunities relating to the rights of children are especially notable in the retail industry.

## Relevance of Artificial Intelligence

- » **Targeted Advertising:** Using AI to undertake more precise advertising, both online and off-line, and understanding at a more granular level what customers might want.
- » **The Shopping Experience:** Using chat bots, automated assistants, and conversational interfaces to augment the shopping experience and make more targeted purchasing recommendations.
- » **Automated Manufacturing:** Deploying AI in ways that automate the manufacturing process and reduce labor costs.
- » **Automated Distribution:** Deploying AI technologies in product distribution, such as drones and self-driving vehicles.
- » **Automated Retail:** Automating the retail process, such as self-checkout or checkout-free stores.
- » **Differential Pricing:** Using a deeper understanding of customer purchasing power to provide different prices for different customers.
- » **AI in Consumer Products:** Deploying AI in consumer products, such as children's toys, home robots, and digital assistants.

## Examples of Human Rights Issues

- » **Child Rights and Digital Advertising.** Use of behavioral targeting and other AI-enabled advertising techniques have the potential to undermine children's privacy and put them at risk of manipulation. The monitoring of children's use of online services can lead to advertisers using children for monetary gains without their informed consent.
- » **Pricing and Nondiscrimination:** While differential pricing can be positive ("children and seniors get in free!"), it also brings the risk of discriminatory impacts based on race, religion, gender, or other characteristics.
- » **Targeted Advertising and Nondiscrimination:** The targeting of advertising based on criteria such as ethnicity, race, or gender can have both beneficial and adverse impacts.
- » **Labor Rights:** The automation of manufacturing, distribution, and checkout will have a significant impact on jobs and employment, with potential negative effects for labor rights.
- » **Privacy:** Collection of vast amounts of consumer data raises the prospect of increased data requests and demands from law enforcement agencies. AI-enabled products (such as digital assistants and children's toys) increase privacy risks, especially for children.
- » **Law Enforcement Relationships:** The massive growth in data held by retailers may increase the demand from law enforcement agencies to access this data. Companies will need clear policies and processes governing what data is shared, with which law enforcement agencies, and under what conditions.

## TRANSPORT AND LOGISTICS

The transport and logistics industry could be transformed by AI. For example, self-driving vehicles have the potential to disrupt the trucking, freight forwarding, and personal transportation industries, while unmanned aircraft systems (i.e., drones) can be deployed to deliver products to consumers in new ways.

These developments will bring new human rights opportunities, such as protecting the right to life by reducing traffic-related deaths and increasing access to public services for the elderly, the disabled, or those living in remote areas.

However, transport and logistics companies will also need to pay attention to new human rights risks arising from these developments, such as the right to privacy, freedom of movement, property, and nondiscrimination. For example, the use of autonomous vehicles may impact the right to freedom of movement if certain areas are “walled off” from specific service providers, while “robotaxi” services will need very strong privacy controls in place, with clear policies and processes governing what data is shared, with whom, and under what conditions. The use of drones will raise novel questions about property rights, such as trespassing and the right to airspace.

The relevance of AI to human rights in the transport and logistics industry mostly arise from increased use of autonomous and intelligent vehicles. These raise a wide range of human rights issues, many of which may seem incomprehensible today—such as the freedom of movement if certain areas are “walled off” from specific service providers, or the hypothetical case of arrests being made by robotaxis.

## Relevance of Artificial Intelligence

- » **Self-Driving Passenger Vehicles:** Growth of “robotaxi” services that make use of autonomous vehicles to lower costs, reduce journey time, and enhance passenger safety.
- » **Self-Driving Trucks:** Use of autonomous trucks and vans to reduce cost and enhance productivity in the movement of goods and materials.
- » **Unmanned Aircraft Systems:** Use of drones to enhance the product distribution infrastructure of retailers, such as covering the “last mile” of product delivery to a customer.
- » **Internet of Things:** Embedding sensors and network connectivity into physical objects (such as vehicles, packages, and products) will provide huge insight into the status of transport and logistics networks, enabling significant gains in efficiency, productivity, tracking, and transparency.
- » **Intelligent Vehicles:** Integration of electronic devices and sensors into vehicles to improve safety and performance, such as emergency warning, fuel efficiency, and mapping.

## Examples of Human Rights Issues

- » **Privacy (Transport):** Robotaxi services may collect significant amounts of data about who is travelling where, when, and with whom. Collection of this data will need to have a clear purpose, and only be shared for reasons consistent with this purpose.
- » **Freedom of Movement:** The use of autonomous vehicles may impact the right to freedom of movement if certain areas are “walled off” from specific service providers—a physical equivalent of net neutrality may be needed.
- » **Law Enforcement Relationships:** The massive growth in data held by transport and logistics companies may increase the demand from law enforcement agencies to access this data. Companies will need clear policies and processes governing what data is shared, with which law enforcement agencies, and under what conditions. The industry overall will need to guard against being a source of control in authoritarian countries.
- » **Privacy (Drones):** The use of recording and sensory devices in drones will need to be overseen in ways that protect privacy rights.
- » **Right to Life:** Autonomous vehicles hold the promise of significant improvements in safety, but ethical judgements will need to be addressed for different traffic accident scenarios. Autonomous vehicles will also need to be resilient to hacking.
- » **Property Rights:** The use of drones will raise novel questions about property rights, such as trespassing and the right to airspace.
- » **Right of Equal Access to Public Service:** The use of AI in transport and logistics could have a negative impact on public transportation and other services used by low-income communities.

## AGRICULTURE

Agriculture has long benefited from new and disruptive technologies. From the advent of automation in the first half of the 20<sup>th</sup> century to today's applications of artificial intelligence, the agricultural sector continues to transform and adapt with technology.

Examples of current and future AI applications include the development of agricultural robots to take over essential tasks such as harvesting crops faster and at higher volumes than humans, algorithms to process data collected by drones and other software to monitor crop and soil health, and machine learning programs to track and predict the ramifications of changing weather patterns on crop yields.<sup>13</sup>

With an anticipated six percent decline in agricultural workers between 2014 and 2024, and an increased focus on lowering costs and increasing productivity, AI is becoming a key aspect of the industry's technological evolution.<sup>14</sup>

AI offers opportunities to advance human rights by reducing workplace injuries and fatalities and protecting the right to food and the right to life through increased productivity and yield of life-sustaining crops. However, the agricultural industry will also need to be mindful of new human rights risks resulting from these advancements, such as job displacement and workforce discrimination, property rights, and the right to privacy.

For example, the automation of farming operations will have a significant impact on jobs and employment, potentially displacing high numbers of low-skill laborers, in favor of workers with specialized technological skills. As the sector is currently experiencing a decrease in available labor, this could have either positive or negative consequences on overall workforce trends. Property rights and the right to privacy will come in to question in cases where property, and the affiliated data, transfers ownership, and with the increase in the use of drones and advanced monitoring systems.

Entire regions may suffer from specific human rights implications if they are "walled off" from AI applications within the agriculture sector. The lack of insight into shifting weather patterns, the inability to monitor soil and crop health in areas experiencing climactic changes, or even the imprecise and subsequent overuse of pesticides could substantially limit the productivity and yield of farming operations without AI applications. Compounded with population growth and existing food security issues, this could result in human rights issues related to the right to food and the right to life.

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<sup>13</sup> <http://www.techemergence.com/ai-agriculture-present-applications-impact/>

<sup>14</sup> <http://www.bls.gov/ooh/farming-fishing-and-forestry/agricultural-workers.htm>

## Relevance of Artificial Intelligence

- » **Autonomous Robots:** Increased use of autonomous robots to handle tasks such as harvesting crops faster and at higher volumes than humans. Also assist with precision spraying of pesticides and fertilizer application, and sensitive crops with specialized harvesting practices.
- » **Intelligent Machines:** Integration of electronic devices and sensors into farming practices to improve productivity and yield through crop and soil monitoring, timely harvests, and accurate crop treatment. Increasingly, they may also be utilized in greenhouse environments, which will grow in number with climatic shifts.
- » **Research and Development:** Analyzing large volumes of data from various sources to improve agricultural research, identify trends, and prevent crop disease. This could also affect research related to new and developing GMOs.
- » **Unmanned Aircraft Systems:** Use of drones to enhance crop and soil monitoring and prevent degradation of soil quality, as well as other unintended environmental impacts.
- » **Predictive Analytics:** Learning models developed to track and predict weather; analyze crop sustainability, pesticide dosage, and application; and evaluate farms for the presence of diseases and pests.

## Human Rights Issues Arising

- » **Right to Food:** Increasing farming yields and productivity despite changes in climate, population growth, and food security issues may increase individuals' access to food despite growing supply concerns. However, lack of access to AI could have negative impacts on production levels and the subsequent right to food in low-income communities or developing countries.
- » **Property Rights:** Similar to other industries, the use of drones will raise novel questions about property rights, such as trespassing and the right to airspace.
- » **Right to Life/Labor Rights:** The automation of farming operations has the potential to greatly improve safety and health standards in agriculture, while the shift in desired skillsets may lead to less dangerous jobs and higher paid wages.
- » **Non-Discrimination (Laborers):** Vulnerable, low-income groups may be disproportionately impacted by job displacement as AI is used for tasks previously carried out by humans. The need to hire workers with technological skill sets to operate new equipment may further displace laborers and discriminate against those without specific experience or educational backgrounds.
- » **Privacy:** The use of recording and sensory devices in drones will need to be overseen in ways that protect privacy rights of farmers, particularly as property, and now historical data, transfer between owners.

## EXTRACTIVES

The application of AI is relatively advanced in the extractives industry through the use of self-driving trucks, intelligent vehicles and machines, large-scale data analysis and machine learning, and monitoring and alert systems. Artificial Intelligence has and will continue to transform the sector. Deployment of AI may take place at each phase of the project life cycle (exploration, front-end engineering and design (FEED), construction, production, decommissioning) in an effort to improve productivity and efficiency at each stage.

Improved prospecting, exploration, extraction, processing, and monitoring will increase the speed, precision, and ultimately the profit margins of the industry.<sup>15</sup> Increasingly effective identification of mineral deposits and oil reserves may prevent the unnecessary disruption of land and other natural resources. Permit evaluation and processing, as well as R&D functions around materials research and new product development, also have the potential for advancement.<sup>16</sup>

While AI applications have the potential to increase efficiency throughout the process, and thus reduce time and human exposure to risky conditions, they will also usher in a number of human rights risks. The most obvious of these risks is job displacement and job loss resulting from increased automation and the application of machine learning for analytical functions. For communities reliant on the income provided through access to these jobs, this is likely to result in negative impacts on basic human rights such as access to land, food, and work.

Due to the different techniques and processes used across different materials, risks will need to be assessed on a customized basis. Despite these risks, AI has the potential to significantly advance the health and safety of workers by minimizing exposure to risk, while decreasing environmental impacts and risks generated by a company's operations (i.e., by preventing oil spills, dam leakages, etc.) through a more efficient and precise extraction process.

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<sup>15</sup> <http://www.techemergence.com/ai-in-mining-mineral-exploration-autonomous-drills/>

<sup>16</sup> [www.edf.org/blog/2018/08/01/artificial-intelligence-has-its-sights-set-americas-oil-and-gas-fields-heres-what](http://www.edf.org/blog/2018/08/01/artificial-intelligence-has-its-sights-set-americas-oil-and-gas-fields-heres-what)

## Relevance of Artificial Intelligence

- » **Self-Driving Trucks:** The use of autonomous trucks to reduce cost, decrease road accidents, and enhance productivity in the transfer of extracted materials.
- » **Intelligent Vehicles and Machines:** Integration of electronic devices and sensors into vehicles to improve safety and performance, such as emergency warning, fuel efficiency, and mapping.
- » **Research and Development:** Analyzing large volumes of data from various sources to speed up and improve materials research and new product development.
- » **Monitoring and Alert Systems:** Integration of advanced monitoring and alert systems to continuously monitor water quality and water use, dam safety, chemical use, oil and gas pipeline leaks, etc.

## Human Rights Issues Arising

- » **Livelihoods:** The automation of extraction, hauling, and even administrative processes will have a significant impact on jobs and employment, with potential negative effects on local economic opportunity and empowerment.
- » **Right to Basic Needs:** For local communities impacted by extractives industries, the income provided through access to jobs has mitigated the negative consequences of land loss. However, job loss due to automation will directly affect communities' basic human rights like access to land, food, jobs, etc.
- » **Right to Life:** Autonomous and intelligent vehicles hold the promise of significant improvements in safety, but ethical judgement will need to be addressed for any extraction accident scenarios in an already risky sector. Autonomous vehicles will also need to be resilient to hacking.
- » **Right to Privacy:** While remote monitoring and alert systems have the potential to increase process efficiency, the application of such technology to monitor the movement and activities of workers has direct implications for workers' right to privacy.

## AI in the Workplace

AI technologies are already changing the dynamics between employers and employees, with potentially positive and adverse implications for the human rights of workers. Almost all companies in all industries are likely already using AI and should be considering the implications for impacts on workers, including in the supply chain. Areas of application of new technologies include:

- » Uses in workforce and workplace management, whereby new technologies are used to support hiring, workplace monitoring/surveillance, “nudging” of worker behavior, promotion, and firing.
- » Use of workplace bots (personal assistants), business process automation, and advanced robotics to automate manufacturing processes that will very likely displace many workers around the world, with especially negative implications for low-skilled workers living in countries lacking social safety nets and retraining schemes.
- » Use of “platform” solutions for business process outsourcing and manufacturing, whereby workers are not treated as employees and so lack traditional protections and access to worker representation. This platform employer model can be used for off-line work (such as ride-hailing, food delivery, and household services) as well as online work (such as clerical, design, data entry, or translation work), and be placed online for people anywhere in the world to bid for. Work is often rewarded in a piecemeal fashion.

All such developments involve widespread collection and use of private data about prospective and current employees and workers in the supply chain. These developments increase the significance of the decisions or recommendations of data-driven models and algorithms which may embed, amplify, or make more opaque existing biases and discriminatory practices. These developments also increase the risk of all companies—not just internet and telecommunications companies—receiving requests for data by governments and law enforcement agencies.

## Relevance of Artificial Intelligence

- » **In Hiring/Recruitment:** Using AI in pre-screening of who should see which job opportunities (for example, on professional networking or job sites); machine analysis of resumes and cover letters that claim to root out human bias; supplementing resumes using social media profiles, habits, and relationships; AI-based video interview tools whereby algorithms analyze word choice, gestures, and voice inflections to assess candidates.
- » **Worker Monitoring:** Using AI in surveillance of factory worker movements, breaks, and productivity. We are seeing an advance from relatively low-tech examples, such as CCTV and fingerprint scanners, to more elaborate “smart badges” and facial recognition technologies. There are also new smartphone applications that can track the movements and locations of workers during and outside of working hours.
- » **Employee Wellness Schemes:** Offering or incentivizing, and sometimes requiring, employees to use health wearables, with data being used to inform promotion and bonus decisions.
- » **Automation:** Using AI-enabled infrastructure to reduce the number of workers needed in business processes, such as in construction, manufacturing, and analysis.

## Examples of Human Rights Issues

- » **Nondiscrimination:** Either taking out unfair human bias from human resources decisions—including firing or promotion—or unwittingly locking in discriminatory practices.
- » **Right to Private Life:** There are concerns that 24/7 workplace tracking and monitoring tools erode the space between private life and the workplace.
- » **Right to Privacy and Consent:** The use of tacking, recording, and sensory devices in workplace contexts will need to be overseen in ways that protect privacy rights. This includes ensuring that workers can opt in or opt out of data collection schemes, something that can be challenging given employer/employee power dynamics.
- » **Right to a Healthy and Safe Workplace:** New technologies have the potential to identify safety risks and protect vulnerable workers, such as women, from abuse. At the same time, surveillance might enable intimidation or erode mental health.
- » **Right to Collective Bargaining:** Collective bargaining plays a key role in negotiating wages and benefits, as well as in addressing grievances. New technologies should be used in ways that do not undermine this right, including for platform workers.

## Looking Forward

For most non-technology companies, the growing prevalence of AI solutions will be accompanied by human rights impacts, risks, and opportunities. We believe that businesses should:

- » **Build a human rights risk map for AI integration:** Companies should build a clear picture of how they will deploy AI and map the associated human rights impacts and risks. This should include identifying entirely new human rights risks for the business and considering how existing human rights risks across the value chain might be altered by AI.
- » **Undertake industrywide human rights impact assessments of AI:** Working with industry peers to identify human rights impacts, risks, and opportunities will allow for shared learning, support efforts that address entire AI value chains, and increase leverage by achieving more together than could be accomplished alone. These assessments should include recommended actions that can be undertaken by individual companies, but also propose changes in law, public policy, and regulation that would increase human rights protections across whole industries, systems, and value chains. In addition to being a public resource, a specific output of these sector-wide assessments could be used as human rights impact assessment toolkits by individual companies.
- » **Engage with multistakeholder efforts focused on the responsible use of AI:** The systemwide characteristics of the human rights impacts, risks, and opportunities associated with AI make collaboration with others—companies, governments, civil society organizations, and professional associations—especially important. The participation of non-technology companies in existing AI collaborative initiatives, and consideration of human rights and AI in existing industry forums, will inform non-technology companies of the latest developments and provide opportunities to shape solutions.
- » **Become a responsible procurer of AI solutions:** Companies in all industries making use of AI will often be buying solutions from technology companies. This should be done in a responsible way; for example, by creating the right internal policies and setting expectations of AI service providers, or working with technology providers to address human rights challenges together.
- » **Engage relevant engineering, R&D, technology, CTO, or data science functions in responsible business strategies and governance mechanisms:** If they are not already involved, companies should integrate these departments and individuals into cross-functional human rights, sustainability, and responsible business committees and working groups. Even if AI integration is a distant reality, socializing these leaders to international standards, societal expectations, and the company's policy commitments will be valuable.

This series of papers has been developed as “working papers” to stimulate discussion and influence the ongoing debate about the responsible use of AI by business. The authors welcome feedback, comment, and dialogue on the papers, and we look forward to working with others to shape the next iteration of these ideas.

Please direct comments or questions to [web@bsr.org](mailto:web@bsr.org).

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## About BSR

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