

Framework for Promoting Workforce Well-being in the AI-Integrated Workplace



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Executive Summary

The Partnership on AI’s “Framework for Promoting Workforce Well-being in the AI- Integrated Workplace” provides a conceptual framework and a set of tools to guide employers, workers, and other stakeholders towards promoting workforce well-being throughout the process of introducing AI into the workplace. As AI technologies become increasingly prevalent in the workplace, our goal is to place workforce well-being at the center of this technological change and resulting metamorphosis in work, well-being, and society, and provide a starting point to discuss and create pragmatic solutions. The importance of making a commitment to worker well-being in earnest has been highlighted by the COVID-19 public health and economic crises which exposed and exacerbated the long-standing inequities in the treatment of workers. Making sure those are not perpetuated further with the introduction of AI systems into the workplace requires deliberate efforts and will not happen automatically.

The Framework is designed to initiate and inform discussions on the impact of AI that strengthen the reciprocal obligations between workers and employers, specifically focusing on worker well-being.¹ The four tools that make up the Framework are both interrelated and independent. Use of these tools will differ by implementing organization and will depend on multiple considerations, such as funding, ability to dedicate time, stage of AI integration, etc.

This paper draws upon existing work by academics, labor unions, and other institutions to explain why organizations should prioritize worker well-being. In doing so, it explores the need for a coherent AI and workforce well-being framework. It also attempts to account for different forms of AI integration into the workplace, outlines the different instances in which workers may encounter AI, and the technological aspects of AI that may impact workers.

Relevant literature has been synthesized into Six Pillars of Workforce Well-being that should be prioritized and protected throughout AI integration. Human rights is the first pillar, and supports all aspects of workforce well-being. The five additional pillars of well-being include physical, financial, intellectual, emotional well-being, as well as purpose and meaning.

1 For example, the International Labour Organization in 2006 created recommendations guiding the employment relationship towards ensuring that labour law and practice promotes decent work. For more information see: *International Labour Organization. Employment Relationship Recommendation*, 2006. Available at: <https://www.ilo.org/public/english/standards/relm/ilc/ilc95/pdf/rep-v-1.pdf> and https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_INSTRUMENT_ID:312535

The Framework presents four tools for organizational leaders, workers and other stakeholders as part of the section entitled “Promoting Workforce Well-being in the AI Integrated Workplace”:

- 1.** Key Considerations for organizations to keep in mind when implementing the Framework. These are meant to promote trust amongst stakeholders, facilitate discussion and negotiation of competing interests, and ensure that the Framework is used to facilitate bottom up engagement, build evidence, and create solutions.
- 2.** Recommendations that organizations can use to guide organizational thinking about promoting well-being throughout the integration of AI in the workplace.
- 3.** Discussion Questions to guide organizational best practices throughout the AI lifecycle, which are intended for decision makers and can be useful for all stakeholders.
- 4.** A Worker Survey to help organizations assess the impact of AI on the well-being of the workforce.

The “Framework for Promoting Workforce Well-Being in the AI-Integrated Workplace” is a product of the Partnership on AI’s AI, Labor, and the Economy (AILE) Expert Group, formed through a collaborative process of research, scoping, and iteration. In August 2019, at a workshop called “Workforce Well-being in the AI-Integrated Workplace” co-hosted by PAI and the Ford Foundation, this work received additional input from experts, academics, industry, labour unions, and civil society. Though this document reflects the inputs of many PAI Partner organizations, it should not under any circumstances be read as representing the views of any particular organization or individual within this Expert Group, or any specific PAI Partner.

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About The Partnership on AI

The Partnership on AI (PAI) is the leading forum addressing the most important and difficult decisions on the future of AI. We are a non-profit that invites diverse voices into the process of technical governance, design, and deployment of AI technologies. Our essential Partners work together across industry, academia, and civil society to understand the implications of AI advancements and ensure they benefit society equitably. Through dialogue, insight, education, and guidance, PAI informs responsible AI solutions and identifies opportunities to address humanity's pressing challenges

The Partnership is an independent organization. While supported and shaped by our Partner community, the Partnership is ultimately more than a sum of its parts, and will make independent determinations to which its Partners will collectively contribute but never individually dictate. Accordingly, the Partnership on AI does not exist to be in service of any one organization. Rather, its Partners contribute in service of the organization's mission, which is in the public interest.

Introduction

Artificial Intelligence (AI) is a rapidly evolving technology with the potential to catalyze workplace and workforce changes at both the macro and micro level. This includes drastically reshaping and impacting the nature of work, the skills required, power structures - including privilege and inequality - within organizations and across sectors, and the day-to-day realities of workers that interact with the technology. Globally, more organizations are prioritizing AI and many leaders see it a necessary part of the future for their business.²

AI has the potential to impact all workers regardless of occupation, skill level and sector of activity. As such, its effects are not confined to routine low-to-middle income jobs, such as drivers, warehouse workers, and data analysts; but are increasingly also found in industries with highly educated and well-paid workers, including those in medicine, finance, and information technology.³

The impacts of AI in the context of work are both promising and alarming. AI can bring increased productivity and deeper insights, as well as the growth of wage inequalities and infringements on worker autonomy and privacy. Researchers and policymakers worry about AI's impact on the present workforce and on the future of work in both advanced and developing economies worldwide.

The complexity of economic and socio-technical systems and AI's differential impact on all types of labor makes it difficult to accurately forecast AI's effects on the workforce, as well as cleanly separate the impact of AI from the impact of other technologies being introduced into the workplace. Yet it is critical for policymakers, employers, workers and other concerned stakeholders to proactively discuss and shape together how AI can bring shared benefits to the workplace and to society.

2 For example, a 2018 study from Accenture found that 42% of executives believe AI will be behind every new innovation in their organization in the next three years. For more information see: *Bringing AI into the workforce: the future is closer than you think*. 15th March 2018. Accenture. Available at: <https://www.accenture-insights.nl/en-us/articles/ai-future-workforce-closer-than-you-think>

3 Frank, M. R., Autor, D., ... Rahwan, I. (2019). *Toward understanding the impact of artificial intelligence on labor*. Proceedings of the National Academy of Sciences of the United States of America, 116(14), 6531-6539. <https://doi.org/10.1073/pnas.1900949116>

Applications of AI in the Workplace

The scope and scale of the integration of AI systems into the workplace can take on a wide variety of forms. It can range, for example, from the large scale integration of an AI system into a workflow, to a new feature or change to an existing codebase that may include machine learning (ML) models or other types of AI. Workers can encounter AI at all stages of the worker life cycle, including when seeking a job and during the hiring process, carrying out work and assigned tasks, during capacity building and training sessions, interacting with administration and HR, and leaving and transitioning from a job.⁴ AI is characterized by the collection and algorithmic processing of vast amounts of data, increased computing power that enables faster and more in depth analysis and action, the intelligent automation of decisions and processes, and a self learning ability. With these characteristics, AI has the capacity to automate, augment, or replace human-developed capability and skills. For example, AI can replace decisions based on human considerations with decisions based on data-based measurements and parameters, it can personalize and shape work experiences based on new and different forms of data, and it can mediate interactions between humans, and between humans and machines.

Applications of AI in the workplace are growing. An AI system can be used, among others, in the following ways:

- **As a tool for evaluating and managing the workforce:** AI can collect and analyze a range of data points about an individual, a group of individuals, or an information area to filter, inform, provide feedback, monitor progress, or reach a decision. This can include tracking inputs over a period of time, in products, projects, activities, communication, in individual and group performance etc. Examples include performing worker engagement analysis, augmenting talent filtering and acquisition, designing and implementing worker evaluations, and providing real time evaluation and ratings of worker performance.⁵
- **As a mediating interface:** AI can serve as an interface between managers and workers, between internal departments in the organization, or between workers and external customers. In this case the worker may be interacting directly with the AI interface, may be assisted by the AI, may be nudged by AI, or may be answering queries that were referred to them by the AI. Examples include AI assistants that work with workers to schedule and manage meetings and AI human resources (HR) chatbots that field questions from workers.
- **As workers' collaborator:** AI can also work alongside individual workers and collaborate with them to augment the value of human labor. Examples include "co-bots," which work side-by-side with human workers carrying out physical work either fully autonomously or in an augmenting capacity.
- **As a training tool:** AI can also simulate different scenarios and experiences to train workers. For example, AI is being used in mixed reality training experiences for nurses and doctors.

4 For examples see: Megan Eckstein, "Artificial Intelligence Could Speed Up Navy Training as New Tech is Rapidly Fielded." Feb. 21, 2019. Available at: <https://news.usni.org/2019/02/21/artificial-intelligence-speed-training-new-tech-rapidly-fielded>; Victor Tangermann, "Amazon used an AI to automatically fire low productivity workers." Futurism.com. April 2019. Available at: <https://futurism.com/amazon-ai-fire-workers>; Peter Cappelli and Anna Tavis, "HR Goes Agile," HBR. April 2018. Available at: <https://hbr.org/2018/03/the-new-rules-of-talent-management>; and AI powered strength assessments and performance insight tools - <https://knowyourday.ai/> and <https://www.joinkoru.com/>

5 One example is the use of AI in call centers to provide workers, and their supervisors, with real time performance input. For more information see: Kevin Roose. "A Machine May Not Take Your Job but One Could Become Your Boss," June 23, 2019. The New York Times. Available at: <https://www.nytimes.com/2019/06/23/technology/artificial-intelligence-ai-workplace.html>

Ethical Questions Associated with AI Integration

Though the integration of AI into the workplace comes with the prospect of efficiency and increased productivity, it also raises a number of ethical questions and concerns about the impact of AI on workers that companies will have to grapple with as they continue to integrate AI. For example:

- What will be the impact of decisions, interactions, and processes that traditionally have been human-to-human now becoming human-to-machine?
- What will be the impact of replacing human logic with machine logic?
- What will be the impact of introducing intelligent systems that learn from their environment into the workplace?
- What will be the impact of collecting and using real time data to inform decisions about workers and work?
- How will the relationship between people and their employers change as a result of these impacts?
- Are there some applications that should not be deployed due to ethical concerns?

Along these lines, there is a growing body of use cases and research that recognizes the potential for AI in the workplace but also documents concerns and harms that can be caused directly by AI or can be amplified by AI. These harms can impact workers and work in a multitude of ways, including job loss, wage disparity, worker surveillance, exploitative work practices, bias and discrimination, and information or power asymmetries.⁶

⁶ For examples see: Sam Adler-Bell and Michelle Miller. The Datafication of Employment. The Century Foundation. December 19th 2018. Available at: <https://tcf.org/content/report/datafication-employment-surveillance-capitalism-shaping-workers-futures-without-knowledge/?session=1&agreed=1> and Ifeoma Ajunwa, Kate Crawford, and Jason Schultz, Limitless Worker Surveillance, 105 Cal. L. Rev. 735 (2017). Available at SSRN: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2746211

Why Workforce Well-being

Well-being is a clear component of social research with a multitude of definitions.⁷ Well-being and work exist in a two-way interdependent relationship, with a growing recognition that worker well-being serves as a critical precursor to a company's ability to innovate, compete, attract investment, and ensure long term organizational sustainability.⁸ There is also a body of research that demonstrates that work is a critical factor in and directly impacts human well-being.⁹ In particular, there is widespread recognition of the critical role that labour unions and work organizations play in ensuring, promoting, and protecting worker well-being.¹⁰

This Framework seeks to contribute to research and actions that strengthen worker well-being. It is grounded in the understanding that as AI becomes increasingly diffused in the workplace, prioritizing and capturing work and workplace evolution in a formal frame of well-being enables organisations and society to fully capitalize on the benefits of AI while protecting against potential harms.

- 7 Anna Alexandrova. A Philosophy for the Science of Well-Being. 2017. Oxford University Press. Available at: <https://global.oup.com/academic/product/a-philosophy-for-the-science-of-well-being-9780199300518?cc=gb&lang=en#>
- 8 For examples see: Ophelia Yeung and Katherine Johnston. "The Future of Wellness at Work." Global Wellness Institute, January, 2016. Available at: <https://www.glwswellbeing.com/wp-content/uploads/2018/02/The-Future-of-Wellnessat-Work-Global-Wellness-Institute-2016.pdf> and Implementing an Integrated Approach, Harvard Center for Work, Health, and Wellbeing. 2017. Available at: http://centerforworkhealth.sph.harvard.edu/sites/default/files/10.12.17_Guidelines_Screen_post.pdf and Litchfield, Paul et al. "Work and Wellbeing in the 21st Century." International journal of environmental research and public health vol. 13,11 1065. 31 Oct. 2016, doi:10.3390/ijerph13111065
- 9 For example see: Centre for Confidence and Well-being. Having a Job contributes to well-being. Available at: <http://www.centreforconfidence.co.uk/flourishing-lives.php?p=cGlkPTlyNCZpZD04NDk=> and Gordon Waddell and A Kim Burton. Is Work Good for your Health and Well-Being. Available at: <https://cardinal-management.co.uk/wp-content/uploads/2016/04/Burton-Waddell-is-work-good-for-you.pdf>
- 10 For example see: Hagedorn, Jenn. The Role of Labour Unions in Creating Working Conditions that Promote Public Health. Am J Public Health. 2016 June; 106(6);989-995; Marina Monaco and Luca Pastorelli. Trade Unions and Worker Cooperatives in Europe: A win-win Relationship. ILO. Available at: https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---actrav/documents/meetingdocument/wcms_234169.pdf Health and Safety at work: A trade union priority. Labour Education 2002/1. Available at: https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---actrav/documents/publication/wcms_111465.pdf

About the Framework

The Framework for Promoting Workforce Well-being in the AI Integrated Workplace is based on the key role of human agency, and is designed to be a tool to facilitate integration of AI in a way that prioritizes, promotes, and protects worker well-being. Organizations interested in supporting worker well-being as the use of AI grows in the workplace can use the recommended practices and questions articulated in the Framework to guide their integration of AI, evaluate its impact and act in accordance with the results of that evaluation.

The Framework is not meant to be prescriptive in its approach. Rather, it is intended to be a tool to facilitate an inclusive dialogue across stakeholders by highlighting priority areas of well-being for organizations to focus on as well as articulating a set of questions to further guide discussions and decision making. It is our hope that the Framework will serve as a tool for organizations, and also facilitate broader dialogue across industry, academia, civil society, and the broader public.

We acknowledge that the contexts for having a dialogue on worker well-being may differ. For instance, in some countries there are formal structures in place such as workers' councils that facilitate the dialogue between employers and workers. In other cases, countries or sectors do not have these institutions in place, nor a tradition for dialogue between the two parties. In all cases, the aim of this Framework is to be a useful tool for all parties to collaboratively ensure that the introduction of AI technologies goes hand in hand with a commitment to worker well-being.

New conceptual frameworks, processes, and social institutions will be necessary to ensure that transitions to AI-integrated organizations/spaces are as inclusive and empowering as possible. We offer this Framework as one resource toward facilitating this process in a way that promotes the well-being of individual workers and the workforce.

PART 1

Six Pillars of Workforce Well-being and AI Impact

This section synthesizes relevant literature around well-being into Six Pillars of Workforce Well-being that should be prioritized and protected throughout AI integration in the workplace. These pillars serve as a foundation for our Framework for Workforce Well-being and AI Integration, presented in Part 2. While we recognize that there are multiple definitions, categories, and components of well-being, this document highlights elements of well-being that we feel are critical for organizations to focus on when integrating AI.

Human rights is an overarching cornerstone of the Framework. As the first pillar, it supports all aspects of worker well-being. The five additional pillars of well-being used in the Framework include physical, financial, intellectual, and emotional well-being, as well as purpose and meaning.

We recognize that the impacts of AI are still emerging, and that organizations are challenged to address the unknown and potentially fundamental changes that AI may bring to the workplace. Though the integration of AI into the workplace is still nascent, case studies of initial changes and impacts are starting to emerge. Lessons from past experiences with technological integration are also valuable, as AI has the potential to carry forward and amplify known impacts.

In the section below, we discuss each aspect of well-being and the impact of AI separately, although we recognize that impacts on well-being are interrelated and interdependent. For example, workload and structure of tasks as well as other work-related stress and anxiety can negatively impact both the emotional and physical well-being of a worker. Similarly, AI used to manage an individual can simultaneously impact their emotional, physical, and financial well-being, and a biased decision made by an AI can impact financial as well as emotional well-being.

The literature documenting realized and potential impact of AI integrations on workforce well-being is still emergent, hence the impact of AI on some aspects of well-being is more fully understood relative to impact on other aspects. It is also important to note that because AI integration is frequently conducted as a part of a broader digital transformation, AI's unique impact on well-being is sometimes difficult to attribute in isolation.

Six Pillars of Workplace Well-being

1. Human Rights

Privacy, Freedom of Expression & Thought, the Right to Live without Discrimination, Due Process, Redress/Remedy, & Equality

2. Physical Safety and Health

Physical Safety
Physical Health & Activity
Work-Life Integration

3. Financial Well-being

Job Security
Fair Wages, & Benefits
Equitable Opportunity

4. Intellectual Well-being

Quality of work
Skills & Training
Task Identification & Task Significance

5. Emotional Well-being

Community, Communication, & Support
Diversity & Inclusivity
Autonomy, Privacy & Control

6. Purpose & Meaning

Dignity & Humanization
Humanity-Centric Use & Design

1. Human Rights

There is a growing body of work that emphasizes the role that the private sector plays in upholding the human rights of its users and workers.¹¹ An authoritative list of core internationally recognized human rights is contained in the International Bill of Human Rights (consisting of the Universal Declaration of Human Rights (UDHR)¹² and the main instruments through which it has been codified: the International Covenant on Civil and Political Rights and the International Covenant on Economic, Social and Cultural Rights), along with the principles concerning fundamental rights in the eight International Labor Organization core conventions as set out in the Declaration on Fundamental Principles and Rights at Work. As per the commentary on the UN Guiding Principles on Business and Human Rights, these should serve as the benchmark against which the performance of private actors in protecting human rights is measured. The UN Guiding Principles on Business and Human Rights creates a framework centered around respecting, protecting, and advancing human rights, undertaking human rights due diligence, and ensuring access to effective and legitimate remediation via legal and non-legal tools.¹³ There is also a recognition that technology has the ability to positively and negatively impact human rights as articulated in the UDHR, as well as having the ability to impact our basic 'right to be human' and freedom to form our life and work opportunities.¹⁴

Like all business conduct, as articulated in the widely accepted UN Guiding Principles on business and human rights referenced above, AI's implementation must also be aligned to societal values including human rights.¹⁵ Accordingly, a framework on worker well-being must be fully informed by and grounded in respect for human rights. The first step for organizations to promote well-being will be for them to uphold human rights. This includes, but is not limited to, the right to privacy, the right to freedom of thought and expression, and the right to live free of discrimination.¹⁶

11 For example, see Amnesty International stresses on corporate accountability - <https://www.amnesty.org/en/what-we-do/corporate-accountability/>

12 United Nations. UDHR. Available at: <https://www.un.org/en/universal-declaration-human-rights/>

13 United Nations Human Rights Office of the High Commissioner, "Guiding Principles on Business and Human Rights: Implementing the United Nations 'Protect, Respect and Remedy' Framework," United Nations, U.N. Doc. HR/PUB/11/04, 2011. Available at: https://www.ohchr.org/documents/publications/GuidingprinciplesBusinesshr_eN.pdf

14 Mathias Risse. Human Rights and Artificial Intelligence. Caar Centre for Human Rights Policy. Harvard Kennedy School. 2018. Available at: https://caarcenter.hks.harvard.edu/files/cchr/files/humanrightsai_designed.pdf and Wachter, Sandra and Mittelstadt, Brent, A Right to Reasonable Inferences: Re-Thinking Data Protection Law in the Age of Big Data and AI (October 5, 2018). Columbia Business Law Review, 2019(2). Available at SSRN: <https://ssrn.com/abstract=3248829>

15 High Level Expert Group on Artificial Intelligence. Ethics Guidelines for Trustworthy AI. European Commission. April 8th 2019. Available at: <https://ec.europa.eu/digital-single-market/en/news/ethics-guidelines-trustworthy-ai>

16 See: <https://www.ohchr.org/EN/Issues/Privacy/SR/Pages/Internationalstandards.aspx>;

2. Physical Well-being

A state of physical well-being includes the absence of disease or injury. Being physically well allows human beings to carry out social roles without hindrances of physical limitations and bodily pain. It also means the ability to live in a balanced state of body, mind, and spirit, and a recognition of the two way relationship between emotional well-being and physical well-being.¹⁷ This report outlines physical safety, physical health and activity, and work life integration as key facets promoting the physical well-being of workers.

Physical Safety

Physical safety can be ensured through the workplace environment, policies, and practices. Working when unwell, working alone, human error, acting on incomplete information, and negligence can lead to physical safety risks.¹⁸ Policies around injury-related time off, ergonomics, equipment, training and preparedness are some practices that have been found to positively impact physical safety.¹⁹

Past accidents involving AI driven robots and AI systems highlight the potential of AI to negatively impact the physical safety of workers through onsite accidents.²⁰ At the same time, AI has the potential to increase the physical safety of workers by monitoring environmental factors, tracking worker health indicators for signs of strain and incorporating external data to build a more comprehensive understanding of potential threats to physical safety.²¹ These examples highlight the importance of organizations promoting physical safety through adherence to strong safety and legal standards, enacting appropriate training for workers to use AI systems, and enforcing clear human control mechanisms for workers when integrating AI.²²

17 Catherine Capio and Cindy H.Sit, "Physical well-being," Encyclopedia of Quality of Life and Well-Being Research, Available at: https://link.springer.com/referenceworkentry/10.1007%2F978-94-007-0753-5_2166

18 Brian Massey. Worker Safety: what, why and how IoT and AI can help. IBM. October 25th 2018. Available at: <https://www.ibm.com/blogs/internet-of-things/iot-worker-insights-worker-safety-and-ai/>

19 The University of Western Australia. Safety, Health, and Wellbeing. Available at: <http://www.safety.uwa.edu.au/topics/physical>

20 See for instance: Conner Forrest. Robot Kills Worker on Assembly Line, Raising concerns about human-robot collaboration. March 2017. Tech Republic.com. Available at:

<https://www.techrepublic.com/article/robot-kills-worker-on-assembly-line-raising-concerns-about-human-robot-collaboration/> and

Edward Niedermeyer. 10 Lessons From Uber's Fatal Self-Driving Car Crash. March 18th 2019. The Drive. Available at:

<https://www.thedrive.com/tech/27023/10-lessons-from-ubers-fatal-self-driving-car-crash>

21 Jean Miller, "AI and the Impact on Workplace Safety," Nov. 30, 2018. Available at: <https://osg.ca/ai-and-the-impact-on-workplace-safety/>

Physical Health and Activity

Physical health refers to the overall health of the worker, including mental health. Issues such as the safety and cleanliness of the working environment and access to healthcare can impact the physical health of workers.²³ Stress, anxiety, and pressure can negatively impact a worker's mental health.²⁴

Research has shown that individuals engaged in sedentary work in front of the computer for eight hours a day or more develop physical health problems including back problems, weight problems, and muscle weakness.²⁵ Depending on how AI is used in the workplace, it could exacerbate these trends if job profiles continue to require individuals to work full time with computers/technology or if the integration of AI brings with it similar risks and stresses as automation.²⁶ These examples highlight the importance of organizations promoting physical health and activity by focusing on creating diverse work role content and encouraging physical activity at work. It also highlights the importance of organizations being cognizant of the ways the integration of AI may be causing stress, anxiety, frustration, and pressure for workers, thereby negatively affecting workers' physical health. Evaluations, assessments, and obtaining and responding to worker feedback related to physical strain and other issues listed above consistently can help organizations achieve these goals.

Work-life Integration

Work-life integration refers to the ability of individuals to integrate work into their life to a desired degree. Job satisfaction, fatigue, job-induced stress, and work-life imbalance are measures of work-life integration.²⁷ Job structure, compensation, task load, overtime management, paid vacation, sick leave, and parental leave are all aspects of work-life integration. Research has shown that work-life balance support systems like flexitime, job sharing, compressed working hours, home working, working only during school terms, and paid leave during emergencies promote meaningful work-life integration.²⁸ Numerous studies document the negative impacts of overtime work on workers' health, social relationships, and their work-related efficiency.²⁹

- 22 Companies can draw upon existing research on robots and worker safety such as: Murashov, Vladimir et al. "Working safely with robot workers: Recommendations for the new workplace." *Journal of occupational and environmental hygiene* vol. 13,3 (2016): D61-71. doi:10.1080/15459624.2015.1116700 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4779796/>
- 23 For example, see: "A Systems Approach to Worker Health and Wellbeing" by the National Safety Council. Available at: <https://www.nsc.org/Portals/0/Documents/CambpellInstituteandAwardDocuments/Systems-Approach-Worker-Health.pdf>
- 24 Stressors at the workplace can contribute to hypertension, diabetes, and cardiovascular conditions. For examples see: Canadian Centre for Occupational Health and Safety. *Workplace Stress - General*. Available at: <https://www.ccohs.ca/oshanswers/psychosocial/stress.html> and T.Rajgopal. *Mental well-being at the workplace*. *Indian J. Occup Environ Med.* 2010 Sep-Dec. 14(3): 63-65. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3062016/>
- 25 Pauline Genin. "Effect of Work Related Sedentary Time on Overall Health Profile in Active vs. Inactive Office Workers." *Front Public Health*. 2018. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6174317/>. In another example, US research has found that automation lowers general, physical, and mental health. For more information see: Pankaj Patel, "County Level Job Automation Risk and Health: Evidence from the United States" *Social Science and Medicine*. Volume 202, April 2018 pg. 54-60. Available at: <https://www.sciencedirect.com/science/article/abs/pii/S0277953618300819?via%3Dihub>
- 26 Hanno Lorenz, and Fabian Stephany, "Back to the Future - Changing Job Profiles in the Digital Age," *Agenda Austria*, Working Paper No. 13, February 2018. Available at: <https://www.agenda-austria.at/wp-content/uploads/2018/04/aa-wp13-changing-job-profiles.pdf>.
- 27 Sandra Mackey, "Towards a definition of wellness," *Australian Journal of Holistic Nursing*, 7(2), 2000: 34. Available at: <https://search.informit.com.au/documentSummary;dn=492345667359573;res=IELHEA>
- 28 University of Leicester, "Work-life balance supports can improve employee well-being," University of Leicester Press Office, January 19, 2018, Available at: <https://www2.le.ac.uk/offices/press/press-releases/2018/january/work-life-balance-supports-can-improve-employee-well-being>
- 29 Jon Messenger, "Working time and the future of work," *ILO Future of Work Research Paper Series*, 2018, Available at: http://www.ilo.org/wcmsp5/groups/public/---dgreports/---cabinet/documents/publication/wcms_649907.pdf

Constant connection to devices and work and 'bringing your work home' add to the blurring of personal and professional spheres that leads to increased worker stress, burnout, unhappiness at work, and lower productivity levels.³⁰ The expectation that workers be constantly reachable and responsive to digital communications after working hours has also been found to lead to anxiety and depression.³¹ A reaction to "never turning off" has led to France establishing a "right to disconnect."³² Multiple companies and countries have followed France's example and set restrictions on when communications can be sent and responded to by workers.³³ AI may exacerbate this trend to "never turn off" by continuing to enable instant availability. Management and evaluation via AI systems can nudge or push workers into more work or longer work hours. This is particularly concerning when such systems are linked to compensation.³⁴ At the same time, AI could potentially contribute to better work/life integration as it has been associated with trends in remote work and flexible work hours. Additionally, when used with behavioral science, AI could potentially help nudge workers into healthier habits and finding an appropriate balance between life and work, for example by serving up reminders to take regular breaks.³⁵ It is important to note that behavioral applications need to be carefully considered from an ethical standpoint as they raise serious questions about who is determining which behavior is positive, and by what means the behavior is being driven since workers might not be aware of being "nudged" by an AI system.³⁶

- 30 Kerry Hannon "The Perils of working from home." Forbes. May 27, 2013, Available at: <https://www.forbes.com/sites/nextavenue/2013/03/27/the-perils-of-working-from-home/#57e5ecd95645>
- 31 Erin Reid and Lakshmi Ramarajan, "Managing the High Intensity Workplace." HBR. 2016. <https://hbr.org/2016/06/managing-the-high-intensity-workplace>
- 32 Eleanor Beardsley, "For French Law On Right To 'Disconnect,' Much Support – And A Few Doubts," January 3, 2017. Available at: <https://www.npr.org/sections/parallels/2017/01/03/508028703/for-french-law-on-right-to-disconnect-much-support-and-a-few-doubts?t=1552808880714>
- 33 More Countries Consider Implementing a "Right to Disconnect". National Law Review. Jan 29, 2019. Available at: <https://www.natlawreview.com/article/more-countries-consider-implementing-right-to-disconnect>
- 34 Ceylan Yeginsu, If workers slack off, the wristband will know (and Amazon has a patent for it). The New York Times. February 1st 2018. Available at: <https://www.nytimes.com/2018/02/01/technology/amazon-wristband-tracking-privacy.html>, and Amrit Dhillon, "My life is spent in this car": Uber drives its Indian workers to despair," The Guardian, December 4, 2018, <https://www.theguardian.com/global-development/2018/dec/04/my-life-is-spent-in-this-car-uber-drives-indian-workers-to-despair>, Nick Stockton, "Truckers Take on Trump Over Electronic Surveillance Rules." Wired. April, 2018. Available at: <https://www.wired.com/story/trump-truckers-hours-service-electronic-logging-device/>
- 35 Luke Soloway, "Applied Behavioral Science In The Workplace," GenFKD, April 30, 2018. Available at: <http://www.genfkd.org/applied-behavioral-science-workplace> and "Workplace Nudging Persuades People to Desirable Behaviour," Workwire. Available at: <https://www.workwire.nl/en/workplace-nudging/>.
- 36 Brian Patrick Green. "Ethical reflections on artificial intelligence." Scientia et Fides 6, no. 2, 2018: 9-31. Available at: <https://apcz.umk.pl/czasopisma/index.php/SetF/article/view/SetF.2018.015/15729>

3. Financial Well-being

Financial well-being looks at satisfaction with income, consumption patterns, and the sustainability of an individual's socio-economic conditions. It can also directly impact one's physical and mental health. Job security, fair wages, benefits, and equitable opportunity are key facets of promoting the financial well-being of workers.

Job Security, Fair Wages, Benefits

Job security refers to the assurance of gainful employment for a worker.³⁷ Fair wages and benefits collectively refer to the compensation and benefits workers are entitled to via their status under law. Low wages, job insecurity, and lack of short term or long term benefits can negatively impact a number of aspects of an individual's life in and outside of work.³⁸ The automation of tasks or entire jobs brought about by AI can result in displacement, unbundling of tasks, transformation of job profiles, creation of new jobs, and wage disparity.³⁹ These changes can bring about insecurity in one's career. Further, AI advances may contribute to continued expansion of non-standard forms of employment, such as gig workers, zero-hour contract workers, freelancers, and temp staff. Research has found increasing financial insecurity felt by many workers on non-standard contracts.⁴⁰ For example, a 2019 OECD survey found that only 1 in 3 temp workers are able to save for retirement and only 1 in 10 have a written retirement savings plan.⁴¹ This insecurity has led to a larger societal debate around appropriate security nets and benefits in the age of AI. Political acknowledgement of the need to improve social security systems can be found in multiple forums such as the L20 declaration from Berlin⁴² and the EU Commission's 2017 European Pillar of Social Rights.⁴³

- 37 Anne Richter & Katharina Näswall (2019) Job insecurity and trust: Uncovering a mechanism linking job insecurity to well-being, *Work & Stress*, 33:1 Available at: <https://www.tandfonline.com/doi/full/10.1080/02678373.2018.1461709>
- 38 Andrew Yarrow, "How low wages hurt families and perpetuate poverty." OxfamAmerica. 2015. Available at: <https://politicsofpoverty.oxfamamerica.org/2015/04/how-low-wages-hurt-families-and-perpetuate-poverty/>
- 39 For examples see: Morgan Frank. Toward understanding the impact of artificial intelligence on labor. PNAS. April 2, 2019. Available at: <https://www.pnas.org/content/116/14/6531> ; James Manyika and Kevin Sneider. AI, automation, and the future of work: Ten things to solve for. McKinsey Global Institute. June 2018. Available at: <https://www.mckinsey.com/featured-insights/future-of-work/ai-automation-and-the-future-of-work-ten-things-to-solve-for> ; James Manyika. Jobs Lost, Jobs Gained: Workforce Transitions in a time of automation. December 2017. Available at: <https://www.mckinsey.com/~media/mckinsey/featured%20insights/Future%20of%20Organizations/What%20the%20future%20of%20work%20will%20mean%20for%20jobs%20skills%20and%20wages/MGI-Jobs-Lost-Jobs-Gained-Report-December-6-2017.ashx> ; Frontier Economics. The Impact of Artificial Intelligence on Work: An evidence review prepared for the Royal Society and the British Academy. September 2018. Available at: <https://royalsociety.org/~media/policy/projects/ai-and-work/frontier-review-the-impact-of-AI-on-work.pdf> ; "What will be the net impact of AI and related technologies on jobs in China?" PWC. September 2018. Available at: <https://www.pwc.com/gx/en/issues/artificial-intelligence/impact-of-ai-on-jobs-in-china.pdf>
- 40 For examples see: Alex J Wood, Mark Graham, Vili Lehdonvirta. Good Gig, Bad Gig: Autonomy and Algorithmic Control in the Global Gig Economy. *Work, Employment, and Society*. August 8th 2018. Available at: <https://journals.sagepub.com/doi/full/10.1177/0950017018785616> ; Mark Graham, Isis Hjorth, Vili Lehdonvirta. Digital Labour and Development: Impacts of Global Digital Labour Platforms and the Gig Economy on Worker Livelihood. *Transfer: European Review of Labour and Research*. March 16th 2017. Available at: <https://journals.sagepub.com/doi/10.1177/1024258916687250> ; Nicole Torres. Are there good jobs in the Gig economy? *HBR*. July-August 2018. Available at: <https://hbr.org/2018/07/are-there-good-jobs-in-the-gig-economy>
- 41 OECD. Pensions at Glance 2019. 2019. Available at: https://www.oecd-ilibrary.org/social-issues-migration-health/pensions-at-a-glance-2019_b6d3dcfc-en
- 42 B20-L20 Statement for Sustainable Growth, Decent Work and Social Cohesion in the Digital Economy. 2017. Available at: <https://www.b20germany.org/news/article/b20-l20-statement-for-sustainable-growth-decent-work-and-social-cohesion-in-the-digital-economy/>
- 43 The three pillars include equal opportunities and access to the labour market, fair working conditions, and social protection and inclusion. For more information see: European Commission. European Pillar of Social Rights: Building a more inclusive and fairer European Union. 2017. Available at: https://ec.europa.eu/commission/priorities/deeper-and-fairer-economic-and-monetary-union/european-pillar-social-rights_en

Equitable Opportunity

Equitable opportunity refers to the opportunity for all members of an organization to reap the benefits of AI technologies.⁴⁴ It also recognizes that technology can exacerbate inequalities between those with and without the skills to use, produce, design or own technology.⁴⁵ Further, it recognizes that there are structural gender and racial inequities that play a shaping role in worker well-being, which may also be exacerbated by the introduction of AI.⁴⁶ Preliminary empirical evidence suggests that AI innovations appear to be associated with an increase in within-firm wage inequality.⁴⁷

AI's potential to achieve capabilities that will induce fundamental economic transformations raises the risk of a major increase in global inequality and further concentration of income and economic opportunity due to the labor-saving nature of many AI applications.⁴⁸ If AI continues the recent trend of skill-biased technological change, we can expect it to boost the labor market demand for certain groups of workers endowed with specific skills and education, but not others, whose earning potential might be adversely affected.⁴⁹

44 Ariel Conn, "AI should provide a shared benefit for as many people as possible". Jan 10th 2018. Available at:

<https://futureoflife.org/2018/01/10/shared-benefit-principle/>

45 Mathias Risse. Human Rights and Artificial Intelligence. Caar Centre for Human Rights Policy. Harvard Kennedy School. 2018. Available at: https://carcenter.hks.harvard.edu/files/cchr/files/humanrightsai_designed.pdf

46 For example, research has found that female gig workers face a disproportionate amount of wage discrimination. For more information see: Uttam Bajwa, Denise Gastaldo, Erica Di Ruggiero and Lilian Knorr, "The health of workers in the global gig economy," *Globalization and Health*, 14:124, 2018. Available at: <https://globalizationandhealth.biomedcentral.com/track/pdf/10.1186/s12992-018-0444-8>.

47 Dean Alderucci et al, "Quantifying the Impact of AI on Productivity and Labor Demand: Evidence from U.S. Census Microdata" <https://www.aeaweb.org/conference/2020/preliminary/paper/Tz2HdRna>

48 Anton Korinek, and Joseph E. Stiglitz, "Artificial intelligence and its implications for income distribution and unemployment," No. w24174. National Bureau of Economic Research, 2017.

49 Daron Acemoglu, Pascual Restrepo, "Unpacking Skill Bias: Automation and New Tasks," No. w26681. National Bureau of Economic Research, 2020.

4. Intellectual Well-being

Intellectual well-being can be broadly defined as the potential for work to stimulate the individual intellectually and augment their knowledge and skills. It also recognizes the impact that AI can have on an individual's cognitive abilities. Intellectual well-being includes key elements such as quality of work, task identification and significance, and skills and training.

Quality of Work

Quality of work refers to an individual's engagement at work and perceived job satisfaction. An individual's engagement at work and the quality of work have been linked to retention rates, hours worked, quality of outcomes, and use of sick leave.⁵⁰ Where and when an individual works, feedback on their work, and their role can all impact work quality.

Research literature has considered the role of digital technology in shaping the quality of work. For example, one study examined a retail store in Ireland where a number of digital devices guide and continuously generate fine-grained data on worker activities.⁵¹ This changed worker practices in at least two ways: (1) it led to a greater emphasis on measurable aspects of work as indicators of performance and drivers of pay at the expense of 'symbolic work', including the amount and characteristics of interactions with customers, and (2) caused a move from direct monitoring based on supervisor observation to continuous monitoring based on data. The changes led to worker dissatisfaction and disengagement, related to the undervaluation of symbolic work, and a lack of understanding of the operational parameters of the organization as a whole. Other examples have pointed out that AI can potentially replicate and exacerbate trends of disengagement and dissatisfaction, particularly when used to monitor, evaluate and manage workers.⁵² AI can also exacerbate trends of information overload resulting from constant use and input from digital technologies.⁵³ It has also been noted that the ability for AI solutions to be attention capturing through a high degree of personalization that can result in tech dependencies.⁵⁴

50 Deborah Mclellan, William Moore, Eva Nagler, Glorian Sorensen, "Implementing an integrated approach," August 2017. Available at: http://centerforworkhealth.sph.harvard.edu/sites/default/files/10.12.17_Guidelines_Screen_post.pdf

51 Leighton Evans, and Rob Kitchin, "A smart place to work? Big data systems, labor, control and modern retail stores," *New Technology, Work and Employment*, 33(1), 2018: 44-57. Available at: <https://onlinelibrary.wiley.com/doi/full/10.1111/ntwe.12107>

52 For example see: Colin Lecher. How Amazon Automatically Tracks and Fires Warehouse Workers for Productivity. April 25th 2019. The Verge. Available at:

<https://www.theverge.com/2019/4/25/18516004/amazon-warehouse-fulfillment-centers-productivity-firing-terminations>

53 Conner Joyce. Positive technology. Designing work environments for digital well-being. Deloitte Insights. April 16th 2018.

Available at: <https://www2.deloitte.com/insights/us/en/focus/behavioral-economics/negative-impact-technology-business.html>

54 For more information see: Julia Bossmann. Top 9 ethical issues in artificial intelligence. World Economic Forum. 2016. Available at: <https://www.weforum.org/agenda/2016/10/top-10-ethical-issues-in-artificial-intelligence/>

Task Identification and Task Significance

Task identification refers to the ability of workers to understand and recognize the outcome of a completed task, and feeling a sense of accomplishment when the task is complete.⁵⁵ Task significance refers to the worker being able to see the positive impact of their work on others within or outside of the workplace.⁵⁶

Given the capacity of AI systems to enable and accelerate the trend of disaggregation of tasks into smaller microtasks, it is possible for workers to feel more disconnected from the results and goals of their work and unclear about the connection of a specific task with the final product or outcome.⁵⁷

Skills and Training

Skills and training refers to the opportunities provided to workers to access the skills and training, within or outside of the organization, needed to thrive in a workplace. Skills and training are essential for workers to adapt to AI within an existing job, and transition to jobs within an organization or to new jobs. Workload, compensation, training opportunities, feedback, and support structures all impact a worker's ability to access and take advantage of skilling and training opportunities.

As AI is integrated into the workplace, the need to provide new skills and training to workers is widely recognized.⁵⁸ Research has found that new technologies have increased the relative demand for non-routine tasks that require high and varied skill levels while reducing the demand for middle-skill jobs.⁵⁹ New in-demand job profiles include data analysts and scientists, software and applications developers, and ecommerce and social media specialists.⁶⁰ At the same time, it is important to recognize that there is a significant risk of homogenization as organizations increasingly focus on STEM skills to develop and support AI systems. Diverse ecosystems are critical, and workers need to be agile and adaptable to new concepts and business challenges.⁶¹ Some organizations have started to offer training and skilling programs to start to bridge the skill gap.⁶² Potential loss of cognitive skills is an additional concern related to AI automation.⁶³

- 55 Paul Litchfield. Work and Wellbeing in the 21st Century. *International Journal of Environmental Research and Public Health*. 13(11) 1065. October 31st 2016. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5129275/>
- 56 Task identity and task significance are components found in the Job Characteristics Model developed by Hackman and Oldham. Hackman J.R., Oldham G.R. Motivation through the design of work: Test of a theory. *Organ. Behav. Hum. Perform.* 1976;16:250-279. [https://doi.org/10.1016/0030-5073\(76\)90016-7](https://doi.org/10.1016/0030-5073(76)90016-7)
- 57 "Understanding machines: Explainable AI." Accenture. Available at: https://www.accenture.com/_acnmedia/PDF-85/Accenture-Understanding-Machines-Explainable-AI.pdf
- 58 Pablo Illanes, Susan Lund, Mona Mourshed, Scott Rutherford, and Magnus Tyreman, "Retraining and reskilling workers in the age of automation," McKinsey & Company, January 2018. Available at: <https://www.mckinsey.com/featured-insights/future-of-work/retraining-and-reskilling-workers-in-the-age-of-automation>.
- 59 See for example, US Department of Education Privacy Technical Assistance Center Data Security and Management Training. Available at: https://studentprivacy.ed.gov/sites/default/files/resource_document/file/Data%20Security%20and%20Management%20Training_1.pdf
- 60 World Economic Forum. The Future of Jobs Report 2018. Centre for New Economy and Society. 2018. Available at: http://www3.weforum.org/docs/WEF_Future_of_Jobs_2018.pdf
- 61 Brian Peccarelli. AI isn't taking our jobs - but it is changing how we recruit. World Economic Forum. January 14th 2019. <https://www.weforum.org/agenda/2019/01/ai-is-changing-the-way-we-recruit/>
- 62 For example, IBM AI Learning and Certification programs and tools that can be adopted by organizations. For more information see: Ana Echeverri. New IBM Skills Training to Get Clients Up & Running on AI. February 11th, 2019. IBM Think Blog. Available at: <https://www.ibm.com/blogs/think/2019/02/ibm-skills-training-ai/>
- 63 Andrzej Nowak. Assessing Artificial Intelligence for Humanity. *IEEE Technology and Society Magazine*. December 2018. Available at: <https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=8558761> and IEEE. On the Use of AI - the Dependency Dilemma. September 2, 2016. Available at: <http://sites.ieee.org/spotlight/ai-ethical-dilemma/>

5. Emotional Well-being

A useful definition of emotional well-being is offered by the Mental Health Foundation: “a positive sense of well-being which enables an individual to be able to function in society and meet the demands of everyday life; people in good mental health have the ability to recover effectively from illness, change, or misfortune.”⁶⁴ This report highlights categories such as community, support, and communication; diversity and inclusivity; and autonomy, privacy, and control as key aspects of promoting the emotional well-being of workers.

Community, Support, and Communication

Community, support, and communication recognizes that connecting with others, having healthy and supportive interactions and relationships at the workplace, and clear and effective communication among workers, as well as between workers and machines, across levels of hierarchy, are all important aspects of workers’ positive emotional well-being.⁶⁵ Experts have also highlighted that healthy organizations and work cultures enable individuals to flourish by being flexible, adaptive, coherent, energized, and stable.⁶⁶

AI accompanies a growing trend of remote work enabled by instant communication, video conferencing, and screen-sharing tools.⁶⁷ Though these technologies can enable flexible working hours and allow workers to work from home, research has found that they can also result in feelings of isolation due to a lack of face-to-face communication.⁶⁸ A 2019 survey found that 40% of 2,000 remote managers and workers across 10 countries feel lonely and isolated.⁶⁹ It is also important for organizations to recognize that AI integration into the workplace involves its integration into a human social system. Workers will form relationships and communicate in ways that will influence the AI system and vice versa.⁷⁰ At the same time, over-reliance on AI could lead to the disruption and devaluing of interpersonal contact.⁷¹ For example, instead of focusing on human relationships, AI may be used as a ‘tie-breaker’ without resolving the underlying differences or lapses in communication.⁷²

- 64 Emotional Well-being Definition. Vital Work Life. 2016. Available at: <https://insights.vitalworklife.com/blog/2016/01/02/wheel-of-well-being-emotional-dimension-definition>
- 65 Litchfield, P., Cooper, C., Hancock, C., & Watt, P. (2016). Work and Wellbeing in the 21st Century †. *International journal of environmental research and public health*, 13(11), 1065. Available at: <https://doi.org/10.3390/ijerph13111065>
- 66 Skeet, Ann. Culture Assessment Practice - Defining Healthy Organizational Culture. Markkula Center for Applied Ethics at Santa Clara University. October 25th 2019. Available at: <https://www.scu.edu/ethics/culture-assessment-practice/defining-healthy-organizational-culture/>
- 67 Scott Winner, “Trends for 2019: AI, remote working, and rights and royalties” Medium, January 16, 2019. Available at: https://medium.com/datadriveninvestor/trends-for-2019-ai-remote-working-and-rights-and-royalties-dcada1c887ed_
- 68 See for example Dacorum Borough Council Remote and Home Working Policy. 2019, Available at: <https://www.dacorum.gov.uk/docs/default-source/employment-policies/remote-and-home-working-policy-v1-6.pdf?sfvrsn=2>; Marc Bayern, “The 10 rules found in every good remote work policy.” Tech Republic. July 20, 2018. Available at: <https://www.techrepublic.com/article/the-10-rules-found-in-every-good-remote-work-policy/>; J.O Crawford. The Health and Wellbeing of Remote and Mobile Workers. *Occupational Medicine* 2011. Available at: <https://pdfs.semanticscholar.org/daa4/81cc4613c68b281917ea595e8b616e0dcfbd.pdf>
- 69 Lauren Young, “How to create connections at work in the age of isolation.” Reuters. April 12, 2019. Available at: <https://www.reuters.com/article/us-world-work-remoteworkers/how-to-create-connections-at-work-in-the-age-of-isolation-idUSKCN1RO13J>
- 70 Hussein Abbass. Social Integration of Artificial Intelligence: Functions, Automation Allocation Logic and Human-Autonomy Trust. January 14th 2019. *Cognitive Computation*. Available at: <https://link.springer.com/article/10.1007/s12559-018-9619-0>
- 71 David Roe, “How can AI negatively impact employee experiences.” CMS Wire. May 30, 2018. Available at: <https://www.cmswire.com/digital-workplace/how-ai-can-negatively-impact-employee-experiences/>
- 72 Nicholas.A.Christakis, “How AI will rewire us.” The Atlantic. April 2019. Available at: <https://www.theatlantic.com/magazine/archive/2019/04/robots-human-relationships/583204/>

Diversity and Inclusivity

Diversity and inclusivity refers to the presence of multiple cultural and social identities in a workplace. Research has found that inclusive and diverse workplaces impact self-concept, self esteem, and a sense of connectedness and belonging. They enhance career achievement, promote greater work/life balance, reduce discrimination and harassment, and foster pro-social behavior.⁷³

When workplaces depend on algorithms to make or inform decisions that pertain to workers such as hiring or evaluating a worker, the underlying data and training of the algorithm will influence the outcome. Concerns have also been raised that the use of certain AI technologies, like hiring algorithms, may be biased and violate anti-discrimination laws.⁷⁴ Organizations should be aware that in a reality crafted by algorithms, there is a temptation to create homogenous social categories such as gay, straight, hispanic, rich, secular, liberal etc. that do not capture the intricacies of individual existence. Crucially, the individual being categorized has no say in the categorization process, which is driven by the algorithm. Decisions made by AI remove subjective elements - such as personality traits, contribution to a healthy atmosphere in the workplace, and friendliness - from consideration, with both positive and negative consequences.⁷⁵ However, AI could also be used to filter out human biases by aggregating data about historic hiring trends and identifying areas where more diversity is needed, thereby enabling the human being to make a more equitable decision.⁷⁶

Autonomy, Privacy, and Control

Autonomy in the workplace refers to the extent to which an individual can carry out work as they see best.⁷⁷ Privacy in the workplace has been understood as protecting the "territories of the self" - retaining sole discretion over the possession, control, and use of one's personal boundaries.⁷⁸ We understand privacy in the workplace as a right to 'boundary management' that enables the worker to decide how much any individual, or technology, can enter their personally demarcated boundary.⁷⁹ Contemporary sociologists argue that "the private" goes beyond physical boundaries to "consist more and more of a de-spatialized realm of information and symbolic content over which the individual believes she can and should be able to exercise control, regardless of where this individual and this information might be physically located."⁸⁰

73 Felicity Menzies, "How Does Employee Well-being Link to Diversity and Inclusion," Include-Empower.com, August 17, 2018. Available at: <https://cultureplusconsulting.com/2018/08/17/how-does-employee-well-being-link-to-diversity-and-inclusion/>.

74 See for example: Sam Adler Bell and Michelle Miller. The Datafication of Employment. December 19th 2018. The Century Foundation. Available at: <https://tcf.org/content/report/datafication-employment-surveillance-capitalism-shaping-workers-futures-without-knowledge/?session=1>

75 Ibid

76 See John Cheney-Lippold " We are Data: Algorithms and the making of our digital selves" (NYU Press, 2017). Available at: <https://nyupress.org/9781479857593/we-are-data/>

77 Wall, T. D., Corbett, J. M., Clegg, C. W., Jackson, P. R., & Martin, R., "Advanced manufacturing technology and work design: Towards a theoretical framework," Journal of Organizational Behavior, 11(3), 1990: 201-219; Available at: <https://psycnet.apa.org/record/1990-29719-001>

78 Ann Branaman, "Goffman's Social Theory," in The Goffman Reader, ed. by Charles Lemert and Ann Branaman, 1997. Available at: <http://doingmodernity.blogspot.com/2012/07/ann-branaman-goffmans-social-theory.html>.

79 Margot E. Kaminski, "Regulating Real-World Surveillance," 90 Washington Law Review, 1113, 2015. Available at: <https://scholar.law.colorado.edu/articles/405/>.

80 John B. Thompson, "Shifting Boundaries of Public and Private Life."Theory, Culture & Society, 28. 4 (2011): 63. Available at: <https://researchunipd.files.wordpress.com/2012/03/shifting-boundaries-of-public-and-private-life.pdf>

AI integration can impact worker privacy and autonomy. We have seen this with the introduction of technologies that monitor and collect real-time data about employees and their movements.⁸¹ These technologies not only impact the physical and informational privacy and autonomy of workers, they also exacerbate informational power asymmetries between workers and managers.⁸² For example, organizations that use algorithms to categorize, monitor, and evaluate workers can create a sense of uncertainty. This provides managers with structural control even when these decisions are made by AI.⁸³

The application of AI in management systems also differs from previous, primarily incentive-based, forms of workplace governance.⁸⁴ As organizations gather increasing amounts of data about their workers, they no longer have to rely solely on generalized psychological interventions or human-to-human assessments. Instead, they can detect behavioral patterns at the individual level and nudge workers towards the most profitable activities - a phenomenon that is particularly present in the gig economy.⁸⁵ By surveilling workers' activities, often without their consent and knowledge, AI can become a tool in the exploitation and manipulation of workers. Concerns have also been raised about exploitative data practices, including unilateral decisions informed by data that workers do not have knowledge of or access to.⁸⁶

The opacity and lack of explainability stemming from a 'black box' nature of some of the AI systems can lead to workers being unclear about how or why a decision impacting them was reached and unable to contest it.⁸⁷ Depending on the use case of the AI system in question, this concern can be acute. As highlighted by UNI Global Union, "we must never reach the situation where management can simply shrug their shoulders and say 'the algorithm told me to fire you, but I don't know why.'"⁸⁸ Importantly, lack of explainability feeds into and exacerbates a lack of contestability.

81 Ceylan Yeginsu, If Workers Slack off, the wristband will know (and Amazon has a patent for it). The New York Times. February 1st 2018. Available at: <https://www.nytimes.com/2018/02/01/technology/amazon-wristband-tracking-privacy.html>.

82 See, for example, debate over surveillance usage in the U.S. trucking industry: Nick Stockton, "Truckers take on Trump over electronic surveillance rules," Wired. April 3, 2018, Available at: <https://www.wired.com/story/trump-truckers-hours-service-electronic-logging-device/>; Nathan Barlow, "3 Reasons Trucking's new rules will hurt you and Truckers." The Federalist. Jan 11, 2018, Available at: <https://thefederalist.com/2018/01/11/3-reasons-truckings-new-driver-surveillance-rule-will-hurt-truckers/>

83 Oscar Gandy, "Exploring Identity and Identification in Cyberspace," Notre Dame Journal of Ethics & Public Policy, 14 (2000): 1089, <http://scholarship.law.nd.edu/ndjlepp/vol14/iss2/10>.

84 Karen E.C. Levy, "The Contexts of Control: Information, Power, and Truck-Driving Work," The Information Society 31, No.2 (March 15, 2015): 160-74, Available at:

<http://www.karen-levy.net/wp-content/uploads/2016/08/The-Contexts-of-Control-Information-Power-and-Truck-Driving-Work.pdf>

85 Alex Campollo, Madelin San Philipo, Meredith Whittaker and Kate Crawford, "AI Now 2017 Report," 2017, Available at: https://ainowinstitute.org/AI_Now_2017_Report.pdf

86 For more information, see UNI Global Union ten principles for worker's data rights and ten principles for Ethical AI. Available at: <http://www.thefutureworldofwork.org/opinions/10-principles-for-workers-data-rights/>

87 Will Knight. The Dark Secret at the Heart of AI. MIT TEchnology Review. April 11th 2017. Available at: <https://www.technologyreview.com/s/604087/the-dark-secret-at-the-heart-of-ai/>

88 Christina Colclough, "When algorithms hire and fire," Available at: <http://www.thefutureworldofwork.org/media/35506/iur-colclough.pdf>

6. Purpose and Meaning

This section addresses the ability to experience and integrate meaning and purpose in life through connections and relationships with oneself and one's surrounding community and society. In the workplace, these considerations look at how the workplace enables positive engagement with other workers, produces respectful work environments, and encourages responsible corporate citizenship, while also ensuring that the individual feels satisfied with the investment of their own labor.⁸⁹ Dignity and humanization, as well as humanity centric use and design, are key facets of promoting the spiritual well-being of workers.⁹⁰

Dignity and Humanization

Human dignity has been defined as “the ability to establish a sense of self-worth and self-respect and to enjoy the respect of others.”⁹¹ Humanization supports and builds off the understanding that individuals should be recognized as having intrinsic worth and should not be treated as “datafied” objects, placed in predetermined categories.⁹² Aspects of humanization can include agency, recognition of uniqueness, and a sense of belonging.⁹³ The notion of ‘Dignity and Humanization’ also recognizes that work has long served as a source of dignity and purpose for individuals.⁹⁴ Every day, workers across occupations struggle to make work a source of dignity through a variety of means.⁹⁵ Organizations should recognize this and seek to integrate AI in a way that enables and supports this dignity.

Concerns have been raised around AI's potential to fundamentally change the conceptualization, meaning, and patterns of work.⁹⁶ Key trends, such as an increase in knowledge-based and cognitively complex work, decentralization of work, self employment, and the self actualization economy have already been observed as results of digitalization and hyperconnectivity.⁹⁷ AI management systems could provide invasive methods for evaluating workers and making retention decisions.⁹⁸ In addition to depriving the worker of autonomy, AI systems which regularly and invasively surveil workers can also deprive them of dignity. At the same time, AI-powered technologies that augment human capability and increase worker productivity could well be dignity-increasing.

- 89 Judi. C Casey. Employee Well-being: A Comprehensive Approach. Boston College Center for Work & Family. Available at: https://www.bc.edu/content/dam/files/centers/cwf/research/publications/executivebriefingseries/Executive%20Briefing_Employee%20Well-Being_A%20Comprehensive%20Approach
- 90 For the purpose of this Framework we use the term humanity-centric to build on the concept of human centric AI and extend this concept beyond notions of the individual to the understanding that AI should be designed and used in a way that is of service to humanity and the common good. See Appendix 2: Definitions.
- 91 Randy Hodson. Dignity at Work. Ohio State University. 2001. Cambridge University Press. Available at: <https://pdfs.semanticscholar.org/919c/723e7b9952c3444c3852d136e255c8f8a638.pdf>
- 92 For example, the Independent High Level Expert Group on Artificial Intelligence Ethics Guidelines for Trustworthy AI state: “Human Dignity encompasses the idea that every human being possesses an intrinsic worth, which should never be diminished, compromised or repressed by others - nor by new technologies like AI systems.” Available at: https://ec.europa.eu/digital-single-market/en/news/ethics-guidelines-trustworthy-ai_pg.10
- 93 Personnel Today. Humanization concept to boost employee wellbeing. Occupational health & wellbeing. June, 2011. Available at: <https://www.personneltoday.com/hr/humanisation-concept-to-boost-employee-wellbeing/>
- 94 Dr. Juan Somavia. Valuing the dignity of work. United Nations Development Programme. Human Development Reports. 31 March 2015. Available at: <http://hdr.undp.org/en/content/valuing-dignity-work>
- 95 Randy Hodson, Dignity at work . Cambridge University Press, 2001. Available at: <https://www.worldcat.org/title/dignity-at-work/oclc/51296876>
- 96 Nicholas.A.Christakis,“How AI will rewire us,”The Atlantic. April 2019, Available at: <https://www.theatlantic.com/magazine/archive/2019/04/robots-human-relationships/583204/>
- 97 European Commission. Changing nature of work. Available at: https://ec.europa.eu/knowledge4policy/foresight/topic/changing-nature-work_en
- 98 Alex Campollo, Madelin San Philipo, Meredith Whittaker and Kate Crawford, “AI Now 2017 Report,” 2017. Available at: https://ainowinstitute.org/AI_Now_2017_Report.pdf

Humanity-Centric Use and Design

Humanity-centric use and design builds on the concept of human-centric AI and extends this concept beyond notions of the individual to the understanding that AI should be designed and used in a way that is of service to humanity and the common good.⁹⁹ It places an emphasis on the need for an approach to integrating AI into the workplace that is grounded in the needs of human beings, with holistic social benefit as its primary goal.¹⁰⁰ This means creating and deploying products that are designed not only to maximize revenues, but to also account for psychological, personal, and environmental consequences. One way this can be achieved is through ethical and value-driven design.¹⁰¹

Research has found that AI has reached a stage where, for many cognition related tasks, AI can match or surpass human capabilities. This progress has come with larger questions about the impact AI will have on humanity and an emphasis on the use of AI that is human-centered and that collaborates with humans, enhances human capabilities, and empowers humans to achieve their goals.¹⁰² For example, various companies have called for the design and use of AI in collaborative processes that enrich people's lives and society, and enable human beings to work in tandem with the machine rather than delegating control.¹⁰³ It is also important for organizations to consider the broader implications that AI integration may have beyond organizational boundaries, as research has demonstrated that AI can have cascading effects and can impact workers outside of the primary organization integrating AI systems.¹⁰⁴ The far reaching and fundamental changes that AI can bring to humanity highlights the importance of organizations undertaking a process of value alignment in the design and integration of AI into the workplace to ensure ethical use and use that accounts for psychological, personal, and environmental consequences.¹⁰⁵

99 See, for example, EU Commission Ethics Guidelines for Trustworthy AI. April 2019. Available at:

<https://ec.europa.eu/digital-single-market/en/news/ethics-guidelines-trustworthy-ai>

100 Andreas Tegge, "European Prosperity Through Human-Centric Artificial Intelligence," SAP SE, 2018. Available at:

https://d.dam.sap.com/m/OPAJmX/56574_TL_54890_enUS.pdf

101 Colin Gray. The Dark (Patterns) Side of UX Design. Purdue University. 2018. Available at:

http://colingray.me/wp-content/uploads/2018_Grayetal_CHI_DarkPatternsUXDesign.pdf

102 Andrzej Nowak, "Assessing Artificial Intelligence for Humanity", February 1st 2019, Available at:

<https://technologyandsociety.org/assessing-artificial-intelligence-for-humanity/>

103 See for example: Yuzuru Yamakage, and Seishi Okamoto, "Toward AI for Human Beings: Human Centric AI Zinrai," Fujitsu Scientific & Technical Journal, Vol. 53, No. 1, January 2017: 38-44,

<https://www.fujitsu.com/global/documents/about/resources/publications/fstj/archives/vol53-1/paper07.pdf>

104 For example, research by the PAI AILE Working group found that integration of an AI chatbot into Axis Bank had downfall effects on their third party service vendor. For more information see: AI, Labor, and Economy Case Studies Compendium.Partnership on AI. Available at:

<https://www.partnershiponai.org/compendium-synthesis/>

105 See for example, EU Commission 2019 Ethics Guidelines for Trustworthy AI, which note that AI benefits should be through Trustworthy AI that is aligned with foundational values of respect for human rights, democracy, and the rule of law. Available at:

<https://ec.europa.eu/digital-single-market/en/news/ethics-guidelines-trustworthy-ai>

Summary Chart: AI Impact and the Six Pillars of

Workforce Well-being

The table below summarizes the key points introduced above - the six pillars of wellbeing, along with key subcategories, and ways in which AI can impact those and/or exacerbate existing trends.

Ways in Which AI Can Impact Worker Well-being and/or Exacerbate Existing Trends

1. Human Rights

- + AI can support or detract from human rights including impacting fairness, equality, privacy, freedom of expression, and access to remedy. AI can also impact our basic 'right to be human' and freedom to form our life and work opportunities.

2. Physical Safety and Health

- + AI can support physical safety and health by monitoring environmental factors, tracking worker health indicators, building comprehensive pictures of risks, alter job profiles and modalities of work in ways that improve physical health, nudge workers to healthy habits and behaviors
- POTENTIAL NEGATIVE IMPACTS
- | | |
|----------------------------|---|
| Physical Safety | On-site accidents with AI, loss of control of AI systems, inaccurate information or decision made by AI |
| Physical Health & Activity | Exacerbate the impact of sedentary lifestyles, cause stress and anxiety resulting in negative effects on physical health |
| Work-Life Integration | Blurring of personal and professional spheres, nudging into longer work hours towards greater productivity, exacerbating tech addictions and dependencies |

3. Financial Well-being

- + AI can support financial well-being through creation of new jobs, a redistribution of working time, increased wages
- POTENTIAL NEGATIVE IMPACTS
- | | |
|-----------------------|---|
| Job Security. | Job loss, unbundling of tasks, transformation of job profiles, creation of new jobs, wage polarization, exploitative work conditions and practices |
| Fair Wages & Benefits | |
| Equitable Opportunity | Disproportionately benefiting the developers of technology, the potential for AI to be self-sustaining - i.e AI used to monitor AI or to develop additional AI systems. |

4. Intellectual Well-being

- + AI can support intellectual well-being through the creation of more job profiles that support non-routine and cognitive work for workers to pursue if they desire to. The need for new skills that comes with AI can provide learning opportunities for workers and increase workers' knowledge base.

POTENTIAL NEGATIVE IMPACTS

- Quality of Work Exacerbate trends of greater emphasis on measurable aspects and under evaluation of symbolic work, increased micro monitoring and management, information overload resulting from constant use and input of digital technologies
- Task Identification and Task Significance Lack of understanding of why or how a decision was reached, disaggregation of tasks that can result in uncertainty regarding the connection of a specific task to the outcome of the workflow
- Skills and Training Requirement for new skills, loss of cognitive skills as AI gains the ability to take over tasks and functions i.e reading a map, identifying anomalies etc., exacerbation of tech dependencies, and a risk of an homogenization of skills as more and more organizations seek STEM skills to support and develop AI systems.

5. Emotional Well-being

- + AI can support emotional well-being through enabling stress reducing forms of work, such as flexible work hours and location, and can reduce human bias and ensure inclusivity.

POTENTIAL NEGATIVE IMPACTS

- Community, Support & Communication Exacerbate trends of remote work and feelings of isolation, forming of human-to-machine relationships, AI learning good and bad behaviors in the workplace, disruption of interpersonal contact
- Diversity & Inclusivity Exacerbate bias and discrimination in the workplace, use of homogeneous parameters, categorization of individuals without their input, loss of subjective human considerations
- Autonomy, Privacy & Control Worker surveillance, exploitative work and data practices, informational and power asymmetries, loss of autonomy to define one's own work, overcollection of data, lack of access, control, or ownership of one's own data, lack of meaningful consent.

6. Purpose and Meaning

- + AI can support individuals in finding purpose and meaning at work through collaboration and by augmenting human capabilities so that larger personal and societal goals can be reached and challenges can be overcome

POTENTIAL NEGATIVE IMPACTS

- Humanity Centric Use & Design: Surpass human capabilities, impact individuals and communities beyond the boundaries of the organization.
- Dignity & Humanization: Fundamentally changing the conceptualization and patterns of work, making decisions that deprive the worker of dignity, workers being treated as datafied objects.

PART 2

Framework for Promoting Workforce Well-being in the AI Integrated Workplace

The Framework is comprised of the following parts:

- 1. Key Considerations** for organizations to keep in mind when implementing the Framework, meant to promote trust amongst stakeholders, facilitate discussion and negotiation of competing interests, and ensure that the Framework is used to facilitate bottom up engagement, evidence building and solutions.
- 2. Recommendations** that organizations can use to guide organizational thinking about promoting well-being throughout the integration of AI in the workplace.
- 3. Discussion Questions** to guide organizational best practices throughout the AI lifecycle, intended for decision makers, and useful for all stakeholders.
- 4. Worker Survey** to help organizations assess the impact of AI on the well-being of the workforce.

This Framework was developed with the understanding that organizations should commit to upholding a set of AI integration practices that anticipates and avoids harm to the well-being of a worker or community of workers. This includes a commitment to considering the interests of the individual worker, as well as the collective group of workers, at each stage of AI integration. It is strongly advised that management collaborate with workers directly or with worker representatives in the discussion and implementation of this Framework, and in the development, integration, and use of AI systems in the workplace.

1. Key Considerations

This section articulates key considerations for organizations to keep in mind when implementing the Framework. These considerations are meant to promote trust amongst stakeholders, facilitate discussion and negotiation of competing interests, and ensure that the Framework is used to facilitate bottom up engagement, build evidence, and create solutions.

- **Holistic Consideration of Well-being Pillars:** We have found that aspects of well-being are intricately interlinked and do not happen in isolation - i.e an impact on wages could impact physical and emotional well-being. We recommend that organizations consider the impact of AI integration on all pillars of well-being.
- **Applications:** The Framework can be used as a tool to generate discussion and raise awareness within the organization around AI. It can also be used as a tool to begin to generate the evidence needed to justify investment, inform decisions and interventions, and create standardized practices.¹⁰⁶
- **Recommended Practices:** Well-being can be both a general and a deeply personal experience with many environmental, economic, and experiential inputs that influence how and why individuals prioritize different aspects of well-being. To account for such complexities, we encourage organizations to allow workers to highlight those aspects of well-being that they feel should be prioritized in potential steps and actions taken by the organization.
- **Worker Centric:** Incorporating and prioritizing worker feedback during the process of AI integration provides an opportunity for workers and employers to comprehensively address the potential impacts of technological change. Thus we recommend that the implementation of the Framework is a bottom-up approach that incorporates workers from the outset.
- **Multistakeholder Consultation, Discourse and Dialogue:** This Framework is meant to be a tool that facilitates discussions to inform decisions. As such, it is critical that implementation of the Framework is carried out through collaboration and consultation in an ongoing and iterative process that is open to the entire organization. Though this Framework is targeted at workers and management, the implementation process would also benefit from the involvement of other stakeholders. Critically, where they exist, trade unions, work councils, and other worker organizations are an important source of representation, information, support, and consultation for workers. Thus, they play a critical role in ensuring worker interest is represented throughout the assessment and in facilitation of the Framework's uptake. Similarly, designers and developers of the technology, as well as shareholders, policymakers, further training institutions, academics, civil society, and enforcement agencies, including their capacity for continual oversight and governance, play key roles in shaping the impact of AI on worker well-being.

106 For reference, see: Nesta Standards of Evidence. 2015. Available at: https://media.nesta.org.uk/documents/standards_of_evidence.pdf

- **Commitment and Participation:** The effectiveness and sustainability of well-being processes will require buy-in and commitment from across the organization, starting with the board (where it exists) and executives. It has been noted that to find commitment and participation, it is necessary to present elements of the Framework in a way that addresses the viewpoints and concerns of each stakeholder.¹⁰⁷ This could include undertaking a mapping of stakeholder needs and interests.
- **Transparency & Communication:** Implementation of the framework is an iterative process and thus transparency and communication are key, with built-in mechanisms for stakeholder feedback, evaluation and modification as needed.
- **Individuals, Contractors, and Workers:** Integration of AI impacts individuals inside and outside an organization. From prospective hires that are evaluated and filtered by a hiring algorithm, to third-party vendors that are impacted by the adoption of AI by their clients, we recognize that the impact of an organization adopting AI can reach beyond the traditional boundaries of the workplace and the employer/worker legal relationship. Thus, the Framework should consider the impact on any person who works in a subordinate work arrangement within or beyond the physical boundaries of the organization and across the lifecycle of a worker in a workplace.
- **The Digital Shift:** The integration of AI is often part of a larger digital shift within organizations. **Consequently, AI's impact is intertwined with a number of other factors and is difficult to examine in isolation.** As organizations consider the unique impact that AI may have, it is important for them to also be cognizant of the role other technologies might play.

107 Deborah Mclellan, William Moore, Eva Nagler, Glorian Sorensen, "Implementing an integrated approach," Harvard Center for Work, Health, and Wellbeing. August 2017. Available at: http://centerforworkhealth.sph.harvard.edu/sites/default/files/10.12.17_Framework_lines_Screen_post.pdf

2. Recommendations

This section articulates a set of recommendations to guide organizational approaches and thinking on what to promote, what to be cognizant of, and what to protect against, in terms of worker and workforce well-being while integrating AI into the workplace. These recommendations are organized along the six well-being pillars identified in Part 1 of the Framework, and are meant to serve as a starting place for organizations seeking to apply the present Framework to promote workforce well-being throughout the process of AI integration. Ideally, these can be recognized formally as organizational commitments at the board level and subsequently discussed openly and regularly with the entire organization.

Recommendations For Promoting Worker Well-being During Workplace AI Integration

1. Human Rights

A process of value alignment and a firm commitment to human rights is a necessary precursor to the well-being of workers and the workforce. Organizations should prioritize upholding and respecting human rights as a cornerstone to their commitments to worker well-being. Organizations should also be cognizant of the impact of AI on power structures. This includes establishing mechanisms for accountability and oversight, transparency, redress, remedy and liability, and facilitating an inclusive and consultative integration process that is grounded in the needs of workers.

2. Reinforcing Physical Safety and Health

Physical Safety	Organizations should prioritize the physical safety of workers by adhering to technological safety and legal standards, developing a safe working environment that prioritizes the well-being of workers, providing adequate worker training, and ensuring AI systems are designed to allow for human control.
Physical Health & Activity	Organizations should prioritize active work environments and ensure that individuals have multi-faceted job profiles. Organizations should also seek to understand the impact that other forms of stress triggered by AI systems may have on workers' physical health.
Work-Life Integration	Organizations should recognize that AI, like other technology, could exacerbate the blurring of work/life boundaries by pushing workers to remain constantly 'on'. Organizations should prioritize work/life integration by putting in place structures and policies to support and enhance an individuals work/life balance and enable healthy technology use habits including a right to disconnect from the workplace. Organizations should commit to not using AI for the purpose of driving workers to higher levels of productivity at the cost of well-being.

3. Promoting Financial Well-being

Job Security. Fair Wages & Benefits	Organizations should be proactive in seeking to formally and continuously understand the impact of AI integration on job loss, gain, and transition. Organizations should also prioritize fair and adequate recognition of all forms of work through wages, working conditions, and social security benefits, independently of the form of employment (i.e. full-time, contract, temporary or other).
Equitable Opportunity	Organizations should recognize that the development of AI is dependent on multiple stakeholders, including all those who interact with it. As such, the benefits of AI should be equitably distributed. Specifically, organizations should seek to develop and drive a strategy that ensures that workers from vulnerable communities and groups derive equal benefit from the introduction of AI. Organizations should further examine the impact of AI in contextual realities and understand how AI might exacerbate existing structural racial and gender inequalities including differences across demographic groups.

4. Enhancing Intellectual Well-being

Quality of Work	Organizations should seek to support a worker's right to be given the opportunity for engaging work with the integration of AI and to develop job profiles that draw upon an individual's multiple talents.
Skills & Training	Organizations should commit to a method of systems design that rewards retaining and retraining workers whose work changes or is eliminated due to AI. Organizations should prioritize a worker's right to receive training and skill-building commensurate with the introduction of AI. Organizations should be aware of AI's potential long-term impact on workers' cognitive abilities and should continue to train workers to develop and hone skills independent of AI systems and to think critically and independently about the inputs provided by an AI system.
Task Identification & Task Significance	Organizations should recognize and prioritize the importance of enabling a worker to discern the outcome of their labor. Organizations should ensure that AI driven processes and decisions retain sufficient parameters of explainability and clarity so that workers can determine the significance of each task and their contribution to the final outcome. Given the increasing disaggregation of tasks, it is imperative that workers have sufficient clarity on the connection of a specific task to an outcome in the workflow.

5. Supporting Emotional Well-being

Community, Support & Communication	Organizations should seek to consciously promote community across the organization with a specific focus on remote and temporary workers. Organizations should recognize that AI will be integrated into a social system and humans will create forms of relationships with AI systems. Organizations should take time to collectively discuss the implications of integrating AI on workplace relationships and community.
Diversity & Inclusivity	Organizations should prioritize creating a diverse and inclusive workplace through collectively defining workplace diversity and testing underlying data sets and algorithms for potential bias.
Autonomy, Privacy & Control	<p>Organizations should emphasize human control in AI systems. This includes ensuring that AI systems are designed and developed with input from workers in a manner that ensures the retention of meaningful human control over the algorithmic decision-making process.</p> <p>Organizations should follow a principle of boundary management and ensure that workers maintain intellectual and physical control of their workspace. To address power asymmetries, workers should be given notice when a decision is informed or made by AI or when data is collected and used for an AI system.</p> <p>Organizations should strive to provide the highest level of privacy protection to workers and their data regardless of applicable legal regimes. In particular, the right to data access, portability, and explainability should extend to workers and the workplace.</p>

6. Supporting Purpose and Meaning

Humanity Centric Use & Design	Organizations should recognize that the impact of AI can go beyond the individual worker to workforces and societies at large. Organizations should commit to designing and integrating AI systems starting from a position that looks at their impact on an individual as part of a whole. Organizations should ensure that the hierarchies defined within the AI system are aligned to organizational values and that these have been collectively articulated.
Dignity & Humanization	Organizations should protect against the 'datafication' of workers and work. Emphasis should be given to retaining and emphasizing human characteristics in decision making processes and evaluations.

3. Discussion Questions

This section lays out questions and considerations that can help guide organizations in implementing the recommended practices articulated above. The questions are aligned with the Six Pillars of Workforce Well-being, and structured around three stages of the AI life-cycle - Planning and Business Alignment, Development, and Integration¹⁰⁸ - to help organizations determine which steps would be useful to take at which point.

As a note: Some of the questions may speak to an existing practice or policy, for example, a program promoting physical activity. We encourage organizations to evaluate the adequacy of all existing programs in the context of AI integration in the workplace.

Implementation Recommendation: We recommend that decision makers in the organization use these questions to guide policy and practice while integrating AI. We recognize that an organization may be integrating multiple AI systems that are different in scale and scope, however, we believe these questions are important for creating an ecosystem for any AI system to operate in. Thus, we encourage organizations to use these questions at the earliest opportunity and revisit them on an annual basis. We also realize that organizations come from different contexts, and that some questions may not be applicable or may need to be adapted further.

As the Framework is meant to facilitate discourse, we also encourage organizations to use these questions to facilitate workshops that result in action items and further inform decision-making. We recognize that these can be difficult conversations for workers to have with their supervisors in the room and encourage organizations to think about bringing in third party facilitators or engaging with labor unions for implementation.

108 See Appendix 1 - Definitions for an explanation of each of these three stages

Human Rights

Transparency, Accountability, Oversight, Redress, Liability, and Remedy

Planning and Business Alignment

1. Board Level Commitment: It is important that a commitment to prioritize worker well-being begins at the board level (or top leadership level for organizations that do not have a board). Questions to consider include:

- Has board level commitment to prioritize worker well-being and respect for human rights during AI integration been formally agreed upon?
- Is this commitment effectively brought into relevant policy and reports - i.e., annual and sustainability reports and worker handbooks?
- Does this commitment fall within the scope of information audited on an annual basis?

2. Human Rights Impact Assessment: To preempt and address any potential human rights harms that an AI system may pose, it is important that a risk assessment is carried out at the outset of integrating the technology. The UN Guiding Principles on Business and Human Rights provides guidance to companies on how to implement an HRIA.¹⁰⁹ Questions to consider include:

- Does the organization have a risk assessment and escalation process that defines when an HRIA on a product or practice should be triggered across markets?
- At any point in the planning and integration of an AI system, do workers have a clear method of requesting an HRIA?

¹⁰⁹ For further resources see: UN Guiding Principles on Business and Human Rights. Available at: https://www.ohchr.org/documents/publications/GuidingprinciplesBusinesshr_eN.pdf; Blueprint for Embedding Human Rights in Key Company Functions. Available at: https://www.csreurope.org/sites/default/files/uploads/Human_Rights_Blueprint_0.pdf; Business and Human Rights Indicators to Measure the Corporate Responsibility to Respect: Challenges and Opportunities. Available at: <https://www.ohchr.org/Documents/Issues/Business/ForumSession4/Felice.pdf>; Conducting an Effective Human Rights Impact Assessment; Guidelines, Steps, and Examples. Available at: http://www.bsr.org/reports/BSR_Human_Rights_Impact_Assessments.pdf

3. Metrics of Success: It is important that an organization is clear from the outset on what they hope to achieve with integrating AI and what success will look like. Questions to consider include:

- Have metrics been defined to measure the impact and success of the AI system?
- Are these metrics grounded in worker well-being, including human rights?
- Is there a process and a standard for measuring the impact of the AI integration and communicating it back to workers, including on standard measurements such as return on investment and turnover?

4. Oversight and Accountability: Dedicated oversight boards and councils can help ensure that worker well-being is promoted by the leadership of the organization while integrating AI. Key aspects that organizations should consider when establishing such mechanisms include: accountability to workers and the public, oversight, transparency, diverse membership and composition, established expertise, clear process, internal participation and interaction, agility, enforceability of decisions, and emphasis on considering marginalized individuals, voices, and communities.¹¹⁰ Structures such as Data & AI Governance Councils (advisory bodies maintaining “a holistic and forward looking view of AI, encompassing long-term as well as near-term considerations”¹¹¹) have been proposed as mechanisms to ensure that shareholders, customers, workers, and society benefits from the organization integrating AI. Questions to consider include:

- Has a mechanism for oversight and accountability of the AI integration process been established in consultation with workers?
- Where mechanisms exist (i.e. worker councils), have they been clearly brought in to ensure oversight and accountability. Does the organization maintain auditable records and inventory of decisions taken by AI?

110 For more information see: Bobbie Johnson and Gideon Lichfield. “Hey Google, sorry you lost your ethics council, so we made one for you.” MIT Technology Review. April 6th 2019. Available at:

<https://www.technologyreview.com/s/613281/google-cancels-ateac-ai-ethics-council-what-next/>

111 For example see: Arjun Sethi. Why your board needs an AI council. April 28th 2019. Venturebeat. Available at:

<https://venturebeat.com/2019/04/28/why-your-board-needs-an-ai-council/>

5. Workplace Programs and Change Management: Workplace programs can act as the touchpoint within an organization for well-being and AI. For example, workplace well-being programs are gaining popularity, with companies offering different well-being platforms and programs that can be adopted.¹¹² Research has demonstrated that strong change management strategies are a key part of AI integration including organizational buy-in, technical explainability, and building trust with external stakeholders.¹¹³ Change management allows employers to engage workers during the period of transition towards building this trust. Components of change management include creating a business case for change, developing a common vision, communicating for buy-in, managing the change, and adopting and adjusting to the change.¹¹⁴ A core part of change management and promoting worker well-being involves integrating AI into the workplace in a way that builds trust between workers and decision makers and trust between workers and machines.¹¹⁵ Questions to consider include:

- Is there a workplace program that is the driving force for promoting worker well-being during AI integration throughout the entire organization and can be a point of connection between workers and executives during the integration of AI?
- Is there a change management strategy associated with the integration of AI?

6. Communication and Transparency Plans: Organizations can benefit from putting in place a clear communication plan that sets expectations and clarifies key aspects of the AI system interacting with or impacting workers, including the role it will be taking, how it functions, capabilities of the system, the process for integration, and how it fits into the broader organizational vision. Strong communication strategies can also help to ensure that the integration of the AI system is holistic and does not take place in silos.¹¹⁶ Questions to consider include:

- Has a communication strategy been developed and implemented from the point of deciding to integrate AI and continuing across the integration?
- Have key aspects of the AI system, including the role AI will be taking, how it functions, capabilities of the system, the process for integration, and how it fits into the broader organizational vision been communicated?

112 For examples of different workplace well-being platforms available in the market see: Dr. Steve Aldana. The 25 Most Popular Workplace Well-Being Programs for 2019. April 25th 2019. WellSteps. Available at: <https://www.wellsteps.com/blog/2018/01/03/workplace-wellbeing-programs/>

113 AI, Labor, and the Economy Case Study Compendium. Partnership on AI. Available at: <https://www.partnershiponai.org/compendium-synthesis/>

114 Diane Coles Levine. Workplace Change Management: An Overview. Kimball. 2015. Available at: <https://www.kimball.com/getattachment/1d40879c-a539-4bd5-975b-4bb11d7e815c/Workplace-Change-Management.pdf>

115 For examples of best practices in change management see: USAID Change Management Best Practices Guide. 2015. Available at: <https://www.usaid.gov/sites/default/files/documents/1868/597saj.pdf>

116 For more information see: Sean Duffy. Successfully Integrating AI into the Workplace is a Human Task. CMS Wire. February 21st 2019. Available at: <https://www.cmswire.com/digital-workplace/successfully-integrating-ai-into-the-workplace-is-a-human-task/>

7. Multistakeholder Process: It is important that the process of integrating AI brings input from multiple stakeholders from the outset.¹¹⁷ Questions to consider include:

- Have labor unions (or similar institutions where such exist) and workers been consulted from the outset with respect to the decisions of adopting, designing, and integrating AI? Is there a clear process for them to reject or modify the proposed plan?
- Have other stakeholders including but not limited to shareholders, regulators, community leaders, academics, and civil society been consulted where appropriate throughout the process of integrating AI?
- Are workers encouraged to communicate with trade unions or similar institutions during the integration of AI?

8. Redress and Remedy: To adequately address potential harms, it is important that organizations have robust and effective mechanisms in place through which workers can seek redress, challenge decisions taken by AI, and either request human review of an automated decision or dispute potentially incorrect input data.¹¹⁸ Many organizations already provide access to a variety of existing redress and remedy mechanisms, which could be amended to also cover concerns potentially arising from the introduction of AI in the workplace. Questions to consider include:

- Is the redress mechanism based on the UN Guiding Principles: legitimate, accessible, predictable, equitable, transparent, rights compatible, a source of continuous learning, and based on engagement and dialogue?
- When applicable, are the identified concerns taken up by worker councils or other appropriate bodies?

9. Liability: To further enable remedy, it is important that organizations have clarity on where liability will fall in case of potential harms or inaccuracies. Questions to consider include:

- Have parameters of liability been defined and formalized?
- When applicable, are these parameters included in worker contracts?

117 For example see: Eccles, R. G., & Youmans, T. (2016). Materiality in corporate governance: The statement of significant audiences and materiality. *Journal of Applied Corporate Finance*, 28(2), 39-46. Available at: https://www.hbs.edu/faculty/Publication%20Files/16-023_f29dce5d-cbac-4840-8d5f-32b21e6f644e.pdf

118 For example see: Assessing the Effectiveness of Company Grievance Mechanisms. CSR Europe. 2013. Available at: https://www.csreurope.org/sites/default/files/uploads/Assessing%20the%20effectiveness%20of%20Company%20Grievance%20Mechanisms%20-%20CSR%20Europe%20%282013%29_0.pdf

10. Feedback Mechanism: Is it important that organizations provide meaningful mechanisms for workers to give feedback. Such a mechanism should be accessible and organizations should be accountable to acknowledge and respond to feedback received.¹¹⁹ Questions to consider include:

- Is there a policy to ensure that consistent feedback is given to workers as they engage with AI?
- Do worker assessments and reviews take into consideration subjective and objective aspects?
- Have these mechanisms been adopted for remote and temporary workers?

11. Protection of Workers' Interests: Protections of workers' interests have historically been realized through a variety of means, including trade unions and collective negotiations over specific guarantees such as salaries, benefits, and contracts to uphold workers rights as outlined in International Labour Organization conventions.¹²⁰ Research demonstrates that trade unions can improve conditions for workers in ways that positively impact individual, family, and community well-being.¹²¹ The ILO has highlighted the critical role that collective bargaining can play in enabling workers rights, and ensuring that workers or their representatives have approved the usage of AI applications for supervision or evaluation of workers.¹²² In addition, given the rise of gig and contract work, of which AI is often a component, questions of social security nets for contractual work will continue to be a pressing issue.¹²³ Issues regarding worker protection are also critical due to the transnational nature of contractual work, which makes it less clear which jurisdiction should be applicable to the worker.¹²⁴

12. Training: It is important that all departments that may use AI are provided adequate training. This is particularly true when the use may directly impact the well-being of workers. Questions to consider include:

- Have specific departments like HR been trained in the use of AI including ethics?

119 For example see: UNHCR Innovation Service - 10 Steps to Setting Up an Effective Feedback Mechanism. 2017. Available at:

<https://www.unhcr.org/innovation/10-steps-to-setting-up-an-effective-feedback-mechanism/>

120 International Labor Organization Conventions and Recommendations. Available at: <https://www.ilo.org/global/standards/introduction-to-international-labour-standards/conventions-and-recommendations/lang-en/index.htm>

121 Jenn Hagedorn. The Role of Labour Unions in Creating Working Conditions that Promote Public Health. June 2016. American Journal of Public Health. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4880255/>

122 De Stefano, Valerio, Negotiating the Algorithm: Automation, Artificial Intelligence and Labour Protection (May 16, 2018). Comparative Labor Law & Policy Journal, Vol. 41, No. 1, 2019. Available at SSRN:

<https://ssrn.com/abstract=3178233> or <http://dx.doi.org/10.2139/ssrn.3178233>

123 Gerlind Wisskirchen, "Artificial Intelligence Robotics and their Impact on the Workplace." April 10, 2018. Available at: <https://www.oecd-forum.org/users/77630-dr-gerlind-wisskirchen/posts/31349-artificial-intelligence-and-robotics-and-their-impact-on-the-workplace>

124 Mark Graham, Isis Hjorth, and Vili Lehdonvirta, "Digital labour and development: impacts of global digital labour platforms and the gig economy on worker livelihoods," Transfer, Vol. 23(2), 2017: 140.

Physical Safety and Health

Physical Safety, Physical Health & Activity, Work-Life Integration

Planning and Business Alignment

1. Assessing Health and Safety Risk: It is important that organizations seek to understand the impact of an AI system on the health and safety of workers - including work/life integration - prior and during the integration of AI.¹²⁵ Questions to consider include:

- Have the benefits and risks to worker safety and health that the AI system may pose been assessed?
- Does this assessment take into consideration direct and indirect risks?
- Does it take into consideration the impact of the environment required to maintain and support AI systems?
- Has the impact of the integration/use of the AI system on work hours, work format, intensity, job profile, location, and means of communication of workers been assessed?
- Is there a process for ongoing monitoring, assessment, and measurement of impact and risk during AI integration?

2. Accuracy: The accuracy of an AI system is critical to the well-being of workers and the workforce.¹²⁶ Questions to consider include:

- Have adequate levels of accuracy and methods of determining and communicating these been defined?
- Has the organization and developer assessed that adequate levels of accuracy can be achieved for a given application prior to integrating it into the workplace?
- Has the underlying data in an AI system been tested for inaccuracies and biases?
- Is the AI system audited regularly for accuracy?

125 For more information see: European Agency for Safety and Health at Work. Foresight on new and emerging occupational safety and health risks associated with digitalisation by 2025. Available at: <https://osha.europa.eu/en/publications/summary-foresight-new-and-emerging-occupational-safety-and-health-risks-associated/view>

126 For more information, see for instance: Information Commissioner's Office "Accuracy of AI system outputs and performance measures." Available at: <https://ico.org.uk/about-the-ico/news-and-events/ai-blog-accuracy-of-ai-system-outputs-and-performance-measures>

Development

1. Designing Control: To ensure safety, it is important that AI systems are designed with adequate levels of control for all individuals including those that are differently abled. Questions to consider include:

- Have appropriate levels of human control been built into the system?
- Are these congruent to the potential risk to worker safety?
- Where practical and appropriate, does this include adequate human intervention mechanisms for emergency situations or unanticipated technical failures?
- Has the AI system been developed to ensure accessibility for workers with disabilities?

2. Complying with Standards: Safety, workplace, and technical standards can help organizations ensure that they and AI systems are compliant with industry norms and best practices. A number of standards around AI are beginning to emerge, including those addressing human centred organizations, ethics for autonomous and intelligent systems, ethically aligned design, impact of AI on humans, and worker data governance.¹²⁷

3. Designing Fair Working Conditions: It is important that the working standards that an AI system may potentially drive be considered at the design stage. Questions to consider include:

- If the AI system is collecting data and informing decisions that measure, monitor, evaluate, nudge or otherwise shape the way in which a worker carries out their work, does the design of the system ensure that such inputs are in line with fair working conditions?

127 See for instance: ISO 27501:2019. The human-centred organization - Guidance for managers. Available at: <https://www.iso.org/obp/ui/#iso:std:iso:27501:ed-1:v1:en>; IEEE Standards - <https://standards.ieee.org/content/ieee-standards/en/industry-connections/ec/autonomous-systems.html> and https://standards.ieee.org/content/ieee-standards/en/news/2016/ethically_aligned_design.html; IEEE Project 7010 Recommended Practice for Assessing the Impact of Autonomous and Intelligent Systems on Human Well-being - <https://standards.ieee.org/project/7010.html> and IEEE P7005 - Standard for Transparent Employer Data Governance - <https://standards.ieee.org/project/7005.html> and Uni Global Union's 10 Principles for Workers' Data Rights and Privacy - <http://www.thefutureworldofwork.org/docs/10-principles-for-workers-data-rights-and-privacy/>

Integration

1. Training for Safety: It is important that organizations provide adequate training in safety to all workers interacting with AI. Questions to consider include:

- Is there a program in place to train all workers, including those that are differently abled, in how to safely interact and use the AI system, including how to fully shut off and override the AI system?

2. Creating Safe and Healthy Spaces and Habits: It is important that organizations seek to create a safe and healthy working space. Digital harassment policies, 'right to turn off policies', guidelines for the use of sensitive technologies are all examples of policies that are emerging in the workplace in response to emerging technologies, including AI.¹²⁸ Questions to consider include:

- Has the work environment been adapted to accommodate safety with the integration of the AI system?
- Is there infrastructure in place to ensure workers are provided time and access to opportunities for physical activity?
- Are there structures in place to facilitate healthy technology habits? This could include training, policies, and programs, etc.

128 Skye Schooley, "Workplace harassment: How to recognize and report it," March 11, 2019. Available at: <https://www.businessnewsdaily.com/9426-workplace-harassment.html> and Eleanor Beardsley, "For French Law On Right To 'Disconnect,' Much Support -And A Few Doubts," NPR. January 3, 2017. Available at: <https://www.npr.org/sections/parallels/2017/01/03/508028703/for-french-law-on-right-to-disconnect-much-support-and-a-few-doubts?t=1552808880714> and Western Illinois University's Sensitive Data Handling Procedures - http://www.wiu.edu/vpas/administrative_procedures_handbook/sensitiveData.php

Financial Well-being

Career Security, Fair Wages & Benefits, Equitable Opportunity

Planning and Business Alignment

1. Mapping Impact: To address potential harm to the financial well-being of workers, it is important that organizations map the impact.¹²⁹ Questions to consider include:

- Has the impact of the AI system on (a) the hours worked and scheduling system (b) schedule of payments, (c) pay structures and incentives and (d) benefits been assessed?
- Has the impact of the AI system on job loss, transition, and gain been assessed across the entire organization?

Integration

1. Supporting Transitions: In light of the possibility of AI displacing workers, it is important that organizations focus on providing robust frameworks for transition. Questions to consider include:

- Are there structures of support dedicated to helping individuals transition into different jobs if necessary? This could include skilling and training programs, access to job search portals, paid time while workers are in transition, a framework for adequate severance pay, unemployment insurance, wage subsidies, flexible and reduced hours etc.

2. Recognizing Contract Work: In light of the continued trend of organizations relying on contract work, it is important that this work is adequately recognized with respect to both compensation and attribution. Questions to consider include:

- Are adequate wages and benefits provided for contract work?
- Has compliance with the applicable labor and other agreements during the integration of AI been assessed?

3. Sharing Benefits: Given the potential for AI to exacerbate existing power dynamics and inequalities and that AI necessarily uses inputs from all individuals it interacts with, it is important for organizations to focus on sharing the benefits. Questions to consider include:

- Is there a policy in place to ensure that benefits derived from AI are shared across the organization, including suppliers, subcontractors, temporary and remote workers, with a focus on vulnerable individuals, communities, and groups?

¹²⁹ For examples of concerns see: International Labour Office: "Negotiating the algorithm": Automation, Artificial Intelligence and Labour Protection. 2018. Available at: https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_policy/documents/publication/wcms_634157.pdf

Intellectual Well-being

Career Security, Fair Wages & Benefits, Equitable Opportunity

Planning and Business Alignment

1. Skill Mapping and Programs: Given the need for new skills that AI brings, it is important that organizations have a clear understanding of what skills exist, identify the gaps, and provide adequate structures for skilling. Questions to consider include:

- Have the immediate and future skills that will be needed for the organization to thrive been mapped?
- Has an assessment been undertaken of the skills that will be automated or augmented?
- Is there a skilling program in place? Does this include training workers to adjust to the changes in job requirements?
- Have opportunities for workers to pursue higher education or other learning opportunities been integrated into the organization?
- Have key stakeholders been engaged in the development of this program, including educators and skilling organizations?

2. Promoting Lifelong Learning and Innovation: AI will change the way in which we learn and what we need to know. It is important that organizations focus on promoting lifelong learning. Questions to consider include:

- Is there a tangible organizational commitment to lifelong learning, i.e. time, money, programs?
- Are adequate learning opportunities provided to workers?
- Is there a workplace culture of innovation and learning including encouraging workers to share and pursue ideas on ways to improve a product or process?

Development

1. Retaining Cognitive Skills: As AI takes over tasks and capabilities, humans may lose the ability to perform certain cognitive functions. It is important that organizations recognize this and focus on retaining cognitive skills. Questions to consider include:

- Where possible, has friction been built into the AI system to ensure that workers retain already developed skills and/or develop new cognitive skills?

Integration

1. Using a Multitude of Talents: AI may require individuals to move into jobs that are excessively mundane or repetitive. Questions to consider include:

- Are job profiles that require interaction/use of the AI system multi-faceted and do they draw upon the multiple talents of a worker?

2. Understanding AI: It is important that a worker understands how each task contributes to a larger organizational objective and goal. As AI takes over tasks there is the potential for this connection to become unclear. Questions to consider include:

- Is there a process to ensure that workers fully understand a task, including the component undertaken by AI? Have the capabilities of the AI been clearly communicated?

Emotional Well-being

Community, Communication, & Support ; Diversity & Inclusivity ; Autonomy, Privacy & Control

Planning and Business Alignment

1. Assessing Impact on Interactions: Given that AI may be mediating human-to-human interactions, it is important for organizations to understand the impact on communication and interaction. Questions to consider include:

- Has the impact of the integration/use of AI on human interaction and communication been assessed?
- Has the communication provided by AI been tested for clarity?

2. Building Community: Given that AI can further enable remote work, organizations should emphasize community building. Questions to consider include:

- If the AI system will enable remote work, have resources or alternative mechanisms for building and ensuring community been provided?

3. Defining Organizational Diversity: Given that AI can result in decisions being taken on homogenous and binary factors, it is important for organizations to prioritize diversity. Questions to consider include:

- Have diversity and inclusivity in the workplace been collectively defined by the organization?

Development

1. Representing Diversity: To address the risks of decisions being taken on homogenous and binary factors, it is important for organizations to prioritize diversity. Questions to consider include:

- Is the data set used to train the AI system representative of the diversity present in the relevant population group (workforce, customer base, directly or indirectly affected population etc.)?
- Has the AI system been tested for potential biases and inaccuracies?

2. Designing for Privacy: Given that AI directly impacts the privacy of individuals in many different ways, it is important that privacy is prioritized. Questions to consider include:

- Have principles of “privacy by design” been followed when developing the AI system?

3. Ensuring Usability: Given that an AI system that is difficult to use or is not understandable to workers can lead to frustration and distress, it is important for organizations to prioritize usability. Questions to consider include:

- Has the interface of the AI system been tested for usability?
- Have appropriate rules been built into the AI system to enable workers and AI to collaborate effectively?

Integration

1. Assessing Stress and Anxiety: Given the changes that AI may bring about to workers and their colleagues, it is important for organizations to assess and understand the levels of stress and anxiety associated with the integration. Questions to consider include:

- Have regular assessments been undertaken to understand if workers are stressed or frustrated with the integration process or the AI system?
- Are there processes for workers to communicate with each other during the adoption of the technology and to benefit from information exchange during the integration process?

2. Enabling Privacy: Given the impact on privacy, it is important for organizations to prioritize the same. Questions to consider include:

- Has compliance with legal requirements with respect to data privacy and security been assessed when integrating AI?
- Are workers given notice when they are interacting with an AI system?
- Do workers have the choice to not interact with the AI system?
- Are workers provided access to the data collected by an AI system?

Purpose and Meaning

Humanity - Centric Use & Design, Dignity & Humanization

Planning and Business Alignment

1. Assessing Scope of Impact: AI has the ability to impact individuals within and outside the boundaries of the organization.¹³⁰ Questions to consider include:

- Has the impact of AI within and outside of the organization been assessed?
- Has the impact of the AI system on different groups across the spectrum of individuals within the workplace been assessed? This includes, but is not limited to, skill of workers, gender groups, and ethnic communities.

2. Alignment with workforce needs. Decisions to implement AI systems should be informed and centered around the needs of the workforce. Questions to consider include:

- Has the organization assessed workforce needs and the ability of AI to meet the same?

Integration

1. Enabling Worker Use of AI: Organizations should prioritize use of AI that benefits workers. Questions to consider include:

- Are workers provided with the opportunity to use AI in a way that benefits their work experience?

2. Enabling Worker Control of Decisions by AI Systems: Workers should have the ability to understand when and how an AI takes a decision that directly impacts them. Questions to consider include:

- Does the AI solution make recommendations or take decisions that relate directly to an individual?
- If so, is the individual made aware of the fact that the decision was made by an AI system?
- Do workers have the option of opting out of having AI make such a determination?

130 For examples see: Government of Canada, Directive on Automated Decision Making, Available at: <https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=32592> and EU Guidelines on Ethics in Artificial Intelligence: Context and Implementation as a Guide Towards a 'Human- Centric' Approach to AI. Available at: [https://www.europarl.europa.eu/RegData/etudes/BRIE/2019/640163/EPRS_BRI\(2019\)640163_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2019/640163/EPRS_BRI(2019)640163_EN.pdf) and The Summer Institute on AI and Society, Creating a Tool to Reproducibly Estimate the Ethical Impact of AI. Available at: <https://aipulse.org/creating-a-tool-to-reproducibly-estimate-the-ethical-impact-of-artificial-intelligence/>

4. Worker Survey

Drawing upon the recommended practices and questions listed above, we have developed a worker survey for the purpose of assessing and tracking the impact of AI on worker well-being through a bottom-up methodology that captures impact as experienced by workers.

The survey takes practices found in the recommended practices - such as promoting work/life integration - and asks questions to help organizations understand if workers actually experience a healthy work/life balance in the context of AI integration. The information gathered from the survey can be used to identify gaps, highlight focus areas, and inform policy. The survey questions are aligned with the six pillars of wellbeing and subcategories identified in this paper.

Implementation Recommendation: This survey requires broad participation, as each individual has different perspectives and experiences of well-being and brings different forms of organizational knowledge to the assessment. Recognizing that an organization may be integrating multiple AI systems that are different in scale and scope, the survey will be most effective when assessing AI systems that interact directly with workers. The questions are meant to be posed frequently, in order to generate more comprehensive information on the impact of AI in the workplace. The survey could also be executed in collaboration with a trade/labour union, or with an external, independent group.

We encourage organizations to enable workers to fill out the survey anonymously, with the option of continued engagement with leadership and colleagues. As part of facilitating communication and enabling transparency, the organization should publish aggregate results of the survey and articulate follow up steps that will be taken.

Purpose and Objective of Survey: The purpose of this survey is to assess the impact of AI on worker well-being through a bottom-up methodology that captures impact as experienced by workers. Information collected from the survey can be used to identify gaps, highlight focus areas, and inform policy. The survey questions are aligned with six elements of well-being: human rights, emotional, physical, financial, intellectual, and purpose/meaning.

AI Systems in the Organization:

[In this section, the organization should detail the different AI systems that have been integrated into the workplace and give illustrations of how workers are encountering AI on a daily basis]

Baseline Survey What is your understanding of AI?
As per your understanding, why was the AI system brought into the organization and for what purpose? Is there something more you would like to know about the integration process?
In what ways has AI made your work easier? In what ways has AI made your work more difficult or less efficient?
Which aspects of AI integration do you feel are the most critical and would like to see prioritized?

1. Human Rights

Do you know of oversight and accountability over the integration/use of AI from the board (if applicable) and executives?

Has the organization been open and transparent about the use of AI with all workers?

Are there mechanisms for you to share feedback and/or seek remedy for a harm that resulted from the use of AI?

Overall, do you feel that the AI system is fair?

2. Reinforcing Physical Safety and Health

Physical Safety	If you work alongside AI, have you received safety training for its operation?
Physical Health & Activity	Do you feel that this training is adequate?
Work-Life Integration	Do you feel the use of AI directly or indirectly has an impact on your health?
	Do you feel the use of AI directly or indirectly shapes when you work and for how long? Has this been a positive or a negative?

3. Promoting Financial Well-being

Job Security	Does the integration/use of AI directly or indirectly impact your wages, hours, evaluation, and/or the benefits you receive? How?
Fair Wages & Benefits	What examples of additional training or skills has the organization provided for you? Are there other forms of skills and training support that you would find useful?
Equitable Opportunity	With the integration/use of AI, do you feel there are other/different benefits or structures of support needed? What would these be? Do you feel like you and others benefit from the use of AI in the workplace? Is this benefit equal across the organization?

4. Enhancing Intellectual Well-being

Quality of Work	Has the integration of AI impacted your level of job satisfaction? Has the integration of AI made your job easier?
Skills and Training	With the integration/use of AI, do you feel like your skills and interventions are valued? Do you feel you have all the necessary skills to work with AI? Are there other skills you would like to learn in relation to AI? With the integration/use of AI, are there skills that you no longer use?
Task Identification and Task Significance	With the integration/use of AI, are there tasks that you depend on the AI system to complete? Would you be able to complete these tasks independently if needed? Is there a part of your work that AI could help you with that it currently does not support? With the integration/use of AI, do you understand what work each task you accomplish is contributing to?

5. Supporting Emotional Well-being

Community, Support & Communication	<p>With the integration/use of AI, do you feel more anxious, stressed, and/or frustrated at work than you did prior to its implementation? Why?</p> <p>If you interact directly with an AI system, do you feel that you adequately understand how to use it, when decisions are taken by the AI system, and how and why decisions were reached?</p> <p>If you interact directly with an AI system, do you feel that you are in control of the AI system?</p>
Autonomy, Privacy & Control	<p>With the integration/use of AI, do you feel like you have control and the ability to define your workday?</p> <p>With the integration/use of AI, do you feel like your informational or physical privacy is respected?</p> <p>Have you ever felt like an AI system used your information out of context, inaccurately, or inappropriately?</p> <p>Do you have the ability to access and use the information about you collected by AI as you wish?</p> <p>Do you think that all the information the AI system collects is necessary for it to function properly?</p>

6. Purpose and Meaning

Humanity Centric Use & Design	<p>Has the ethical use of AI been defined in your organization? Do you feel that AI is used in an ethical manner in the workplace?</p> <p>Have you observed impacts of the AI system outside of the immediate workplace?</p>
Dignity & Humanization	<p>Do you feel the integration/use of the AI system is in line with organizational and societal values?</p> <p>When an AI system makes a decision about you, do you feel that it accurately accounted for everything you would have liked it to? Are there aspects that you've observed that are missing from the AI decision-making process?</p> <p>When an AI system has informed a decision about you, do you feel that it assessed you accurately and fairly?</p> <p>With the integration/use of AI, do you feel like you are able to fully express yourself and have your identity recognized in the workplace?</p>

Conclusion and Future Work

A clear priority for future work in this area is the continued refinement and specification of the Framework for Promoting Workforce Well-being in the AI Integrated Workplace, with the goal of developing a robust model for assessing and promoting well-being in an AI-enabled workplace. Such a model must draw from an interdisciplinary perspective and incorporate the views of both management and workers. As part of this mission, it is necessary to better understand and articulate the core constructs of well-being in the AI integrated workplace, the technological factors impacting these constructs, and the varying degrees of independence and interdependence among these variables. Further consultations with key stakeholders, use of evidence collected through implementation, and additional research will be key in developing and refining this model.

Appendix 1 - Definitions

This section introduces some of the core concepts used in the Framework, as well as their definitions and limitations,

AI Lifecycle

Understandings of the AI lifecycle include:

- **Planning and Business Alignment:** The identification of purpose and objectives of AI integration;
- **Development:** The design, data collection and curation, and training of AI systems. The development of AI systems can be at different scales - for example - the development of a large scale software project or the development of a system patch with or without integration testing.
- **Integration:** Bringing AI into organizational workflows, processes, and spaces, and the work modification resulting from the same.¹³¹

Artificial Intelligence

For the purposes of this Framework, we embrace Nils J. Nilsson's broad and evolving definition of AI, namely that "Artificial intelligence is that activity devoted to making machines intelligent, and intelligence is that quality that enables an entity to function appropriately and with foresight in its environment."¹³²

Humanity Centric

We use the term humanity-centric to build on the concept of human centric AI and extend this concept beyond notions of the individual to the understanding that AI should be designed and used in a way that is of service to humanity and the common good.

Human Rights Impact Assessment

We understand a human rights impact assessment (HRIA) as a process for identifying, assessing and addressing the impact of programs, projects, activities related to AI on the human rights of workers.

131 Adapted from the AI lifecycle defined by IBM. For more information see: http://files.messe.de/abstracts/88812_GB_CeBit_Meetup_IBM_AI_lifecycle.pdf

132 Nils J. Nilsson, *The Quest for Artificial Intelligence: A History of Ideas and Achievements*, Cambridge, UK: Cambridge University, 2010. Available at: <https://ai.stanford.edu/~nilsson/QAI/qai.pdf>

Well-Being

We understand well-being as a state of being that promotes physical, financial, intellectual, and emotional prosperity, as well as purpose and meaning.

Worker

We define a worker as a person who is paid for using effort to do something within or beyond the boundaries of the organization.

Workforce

We believe it is important for the impact of AI to be examined throughout the entire organizational supply chain and thus understand the workforce to include full-time, parttime, contract and temporary workers employed by firms and their third party subcontractors.

Workplace

We believe it is important for the impact of AI to be examined throughout the entire organizational supply chain and thus understand the workplace to include firms and their third party subcontractors.

Appendix 2 - Literature Review

1. [Hettler](#) - National Wellness Institute - Six Dimensions of Wellness

Six dimensions of wellness: Occupational, Emotional, Physical, Social, Intellectual, Spiritual National Wellness Institute, along with leaders in health and wellness, shared many interpretations and models of wellness. Through this discussion, there appears to be general agreement that:

- Wellness is a conscious, self-directed and evolving process of achieving full potential
- Wellness is multidimensional and holistic, encompassing lifestyle, mental and spiritual wellbeing, and the environment
- Wellness is positive and affirming

2. [Ryan and Deci](#) - Self Determination Theory

The well-being of workers can be understood from (a) their subjective experience of happiness and (b) their personal achievements, self-actualization, and self-positioning. The second part considers the potential power of human beings.

3. [Luhmann](#) - Subjective Well-being

Subjective well-being (SWB) is comprised of affective and cognitive components. Affective well-being (AWB) refers to the frequency and intensity of positive and negative emotions and mood. Cognitive well-being (CWB) refers to domain-specific and global evaluations of life such as marital satisfaction or global life satisfaction.

Both AWB and CWB are related to personality characteristics such as emotional stability and extraversion, but these correlations are typically stronger for AWB. In contrast, external circumstances such as income, job status, or recent life events tend to have stronger effects on CWB. AWB reflects momentary well-being which is based on concrete and specific experiences whereas CWB reflects long-term well-being which is more global and abstract.

4. [Diener](#) - Subjective Well-being

Subjective well-being is based around the idea of achieving an 'ideal condition'. A person's own set of criteria can be applied to measuring their quality of life as compared to others. Therefore, this makes it a subjective assessment.

5. [IEEE Global Initiative](#)

Well-being can be defined as encompassing human satisfaction with life and the conditions of life as well as an appropriate balance between positive and negative affect.

6. [Organization for Economic Co-Operation and Development's \(OECD\) Guidelines on Measuring Subjective Well-being](#)

The OECD well-being framework considers people's living conditions and quality of life today (current well-being), as well as the resources that will help sustain people's well-being over time (natural, economic, human and social capital).

[OECD Better Life Initiative](#) - Being able to measure people's quality of life is fundamental when assessing the progress of societies. There is now widespread acknowledgement that measuring subjective well-being is an essential part of measuring quality of life alongside other social and economic dimensions.

7. [Sokol](#) - How to Gauge the Effectiveness of Employee Wellness Programs

Advocates for an organized, employer sponsored program that is designed to support employees (and, sometimes, their families) as they adopt and sustain behaviors that reduce health risks, improve quality of life, enhance personal effectiveness, and benefit the organization's bottom line.

8. [Global Wellness Institute](#)

The institute clarifies that wellness at work is a right and a shared responsibility. Wellness is holistic - encompassing physical, mental, emotional, social, environmental, and spiritual aspects; it is embedded in the work culture and environment, and it is proactive and preventative. Wellness at work is the right to work in a manner that is healthy, motivating, and edifying. Everyone - workers, managers, and business owners - should endeavor to work in a way that improves their own wellness and the wellbeing of others.

9. [Bemana et al](#) - Relationship Between Job Stress and Job Satisfaction

Four variables: job satisfaction, fatigue, job-induced stress, and work-life imbalance determine a worker's well-being.

10. [Hackman and Oldham](#) - Job Characteristics Model

- Skill variety
- Task identity
- Task significance
- Autonomy
- Feedback

11. [Chari et al](#) - A New Framework for Defining Worker Well-being

- Workplace physical environment and safety climate
- Workplace policies and culture - organizational policies, programs and practices with the potential to influence worker well-being
- Health status - factors concerning an individual's physical and mental health and welfare
- Work evaluation and experience - perceived factors relating to quality of work life
- Home, community, and society - external factors that affect well-being

12. [ILO](#) (International Labor Organization)

"Workplace Wellbeing relates to all aspects of working life, from the quality and safety of the physical environment, to how workers feel about their work, their working environment, the climate at work and work organization. The aim of measures for workplace well-being is to complement OSH measures to make sure workers are safe, healthy, satisfied and engaged at work."