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Reshaping the Digitization of Public Services

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Abstract

Across the world, public services are rapidly being digitized. However, because of poor public procurement supplier contracts, poor laws, and a lack of governance processes and bodies, and because of competency gaps from all parties involved, digitization is happening in a void. As a consequence, harms are caused and rights are violated, threatening the future of quality public services. From the vantage point of public services as a service as well as a workplace, this article discusses potential remedies to ensure that digitalization does not affect the quality of public services as services and as places of employment. It spells out the additional measures that will be needed to fill the void ethically and ensure that fundamental human rights, freedoms, and autonomy are protected. It concludes that we need to simultaneously slow down and hurry up. We must take the time to get the necessary safeguards in place and continually ask whether more technology really is the right solution to the challenges we face. But also, we need to hurry up to build a critical understanding of the current mode of digitalization so alternatives can be tabled. The article is based on conversations with union members across the world, a literature review, and the author's own studies of the digitalization of public services and employment.

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The COVID-19 pandemic has spurred the digitalization of public services.[1] Though contact-tracing apps may be the best-known form of digitalization right now, the digital transformation is not new and it goes right into the heart of public services—to healthcare, social benefits, infrastructure, citizen safety, education, and policing and legal affairs.[2] The digitalization of public services and the transition to e-government is taking place as public services are under increasing pressure to deliver more at a lower cost. Digital technologies, data analysis tools and processes, and algorithmic systems, artificial-intelligence and machine-learning systems are being introduced with the aim (or the promise?) to improve processes, innovate services, and make public services more efficient. In this article, I refer to all of these systems as "algorithmic" systems because at one point or another they will be used by simple or complex algorithms to derive new information or knowledge.

While we have no figures indicating the amount of public expenditure on systems aimed at improving public services through digital means, much of the evidence we do have suggests that digitization takes place through public procurement—a thirteen-trillion-dollar market globally in US dollars corresponding to 15–20 percent of global GDP.[3] One in three dollars spent by governments is going to a contract with a company.[4] Most of the public procurement spending in the OECD countries (63 percent) is carried out at the subcentral government level.[5]

This digitalization of public services and the transition to e-government is not merely a question of moving from analogue solutions to digital ones or of changing tools or working methods. The use of algorithmic systems, with their algebra, classifications, comparisons, profiles, and predictions, changes the basis on which public services are provided. As Dencik cautions: "When public sector organisations integrate tools and platforms from providers within this [digital] economy to administer the welfare state, they therefore implement not only the systems themselves, but also a regime that propels the further datafication of social life."[6]

The ramifications as well as the depth and breadth of this datification or digitalization of social life must be considered in connection with the digitalization of public services. The effect is that the population and the workers in public services are being turned into the sum of numerous data points. These data points, rather than human needs, wishes, or rights, become the basis on which a decision is made about whether or not a public service or work is provided, removed, or offered. Thus, the digitalization of public services if not carefully governed can lead to violations of human rights, freedoms, and autonomy. Humans are becoming commodified. Algorithmic systems are manipulative.

In this two-edged sword of the digitalization of services as well as work, we can observe the following:

- Algorithmic systems can result in unaccountable decisions if it is not clear why the system produced a given outcome.
- Workers and members of the public may have difficulty seeking redress if they disagree with a decision.
- Algorithmic systems may miss signals that a human would have noticed; the result could be that workers or members of the public do not receive services or interventions they need.
- The use of biased data or bias in the design of the system itself can introduce new bias or entrench existing biases.
- The data generated can be rebundled and sold, threatening privacy rights and human rights.
- Workers' professional autonomy can disappear as they become obliged to follow the systems' recommendations; this loss of autonomy in turn leads to a deskilling of workers and work.

- Monitoring and surveillance is resulting in the intensification of work, as workers are pushed to do more in a shorter length of time.
- The "always on" aspect of digital technologies and algorithmic systems is leading to an increase in working hours.

To fully grasp the potential of digitalization of our social life and our work life, let's look at a few examples of algorithmic systems deployed in public services and in worker management that have gone wrong. Common to them all have been a lack of governance, wide competency gaps, and unclear divisions of responsibilities between developers and the contracting public authority.

When Digitization Goes Wrong, People Are Harmed

A quick glance through the insightful AIAAAC database by Charlie Pownall and the AI Incidents Database by the Partnership on AI reveals more than eight hundred incident reports of public and private sector algorithmic systems gone wrong.[7] We can safely assume that many more such systems are in operation in workplaces across the world. Some may be causing harm and rights abuses that have not reached the public eye. Others may have been designed to do no harm, though, as many scholars working on the relation between digital technologies, ethics, and rights would say, all digital technologies are essentially political,[8] and many exploit the already marginalized.[9] While the private sector accounts for the majority of incident reports, algorithmic systems deployed in public services figure too. Here are some examples that have reached the public eye.

The 2020 A-level algorithm scandal in the United Kingdom is an example in the education sector.[10] Here, the algorithm set out to standardize A-level results across the country. The effect on the students when divided by socioeconomic status was severe: Pupils in the wealthiest of three categories saw their proportion of grade C or above lowered from 89.0 percent to 81.0 percent, a drop of 8 percentage points. Pupils in the lowest category saw their proportion of grade C or above lowered by more than 10 percentage points to 74.6 percent. More than 40 percent of all pupils had their grades downgraded. The Equalities and Human Rights Commission made a public intervention after it emerged that the algorithm treated private school pupils better than those from disadvantaged backgrounds.

Also in the education sector, O'Neil provides the example of how a teacher assessment tool called IMPACT led to the firing of more than two hundred teachers.[11] The problem was that the algorithm and underlying scoring systems did not sufficiently take into account the complexities of real-life circumstances. Teachers were fired if student performance declined from one year to the next. In trying to unravel the algorithms, O'Neil was told "she would never get the source code for that, because in fact, nobody got the source code for that. Because by the contract, it was stipulated that it was proprietary."[12]

In the justice system there is an extensive academic literature on the bias and discrimination inherent in algorithmic risk assessment tools. These tools are used in a variety of criminal justice decisions, assessing data such as an offender's criminal history, education, employment, drug use, and mental health and then predicting the likelihood that that person will reoffend. In 2016, an investigative report by ProPublica called into question the objectivity and fairness of algorithmic risk assessment in predicting future criminality.[13] Their study looked at the data on how more than seven thousand arrestees scored on COMPAS in a pretrial setting in a southern county of Florida. Its findings revealed that COMPAS discriminates against African Americans because its algorithm overpredicts high risk of reoffending.

The Australian government has announced it will refund $720 million to the 470,000 welfare recipients who were unjustly saddled with debt by a faulty algorithm. The automated debt assessment and recovery program popularly named RoboDebt was designed to calculate

overpayments and issue debt notices to welfare recipients. Its automated data-matching system compared public records with averaged income data from the Australian Taxation Office. The scheme was ruled illegal by the courts in 2017.[14]

From 2013 to 2021 when the scandal led to the resignation of the Dutch government, the Dutch tax authorities deployed a self-learning algorithm to spot fraud among people applying for childcare benefits. If an individual was flagged as a fraud risk, a civil servant was required to conduct a manual review. But that worker did not receive information about why the system had generated a higher-risk score. Benefits were frozen immediately, and thousands of families were pushed into poverty as their debts to the tax authorities rose. All because of a suspicion that no one was accountable for and no one could explain. More than a thousand children were taken into foster care during that time. As the scandal unravelled, the system was found to be based on racial profiling—applicants with a non-Dutch nationality were automatically flagged with high-risk scores. In December 2021, the Dutch data protection agency fined the Dutch tax administration €2.75 million for the "unlawful, discriminatory and therefore improper manner" in which the tax authority processed data on the dual nationality of childcare benefit applicants.[15]

In 2019 in Denmark, EuroScore II was introduced in the healthcare system. It is an algorithmic system aimed at determining the risk score of patients and therefore whether or not they should receive heart surgery. The system turned out to be full of programming errors, leading to the wrong treatment of more than five hundred patients.[16]

These examples have several commonalities. First, their discriminative, wrongful, or otherwise harmful impacts could have been avoided or at least flushed out had the algorithmic systems been subject to periodic and rigorous ex-ante and ex-post governance. The obvious errors would have been detected and amended, or failing that, the systems would have been stopped. A hasty deployment certainly doesn't seem to be the right way to go about making public services more efficient. Second, in none of the examples did the subjects of these systems, workers and members of the public, seem to have been involved in the design or governance of these systems. While protests from labor unions, citizen groups, and others followed in the wake of the scandals, their voices were first heard only after the implementation of the algorithmic systems, not before.

Third, in some cases it is nearly impossible to find out what organizations or companies designed and developed the systems and what contractual arrangements were made between them and the public services. This information should be public and easily available, because all workers and members of the public should have the right to know who is handling their data and designing the systems that affect their human rights, freedoms, and autonomy. Fourth, in most of these examples the systems were in existence for several years. While in some cases system failures or inaccuracies had been flagged but had not been responded to (for example, in RoboDebt and COMPAS), in others no concerns seem to have been raised. The absence of reports of system failures or inaccuracies could indicate that (a) nobody knew they should have a rigorous eye on the system's performance, (b) nobody knew what to look for and inquire about, (c) nobody had been told who was responsible for overseeing and reviewing the system, and so (d) everyone thought someone else was doing it. In other words, there was no clear mapping and division of responsibilities; nor did the responsible parties have the necessary competencies to keep a critical and watchful eye on the systems' performance. Fifth, the examples indicate also that the developers of these systems had no active role in monitoring the systems; nor were they using representative data in the first place. This finding gives cause for concern. Not only were the systems poorly designed but the responsible parties were overconfident about the systems themselves.

Some of these observations are mirrored in conversations I have had with public service unions. For example, in a report I wrote for Education International called "Teaching with

Tech," 43 percent of the survey respondents from across the world confirmed that digital technologies are being used to assess teacher performance.[17] The same survey reveals. however, that 57 percent of all unions do not believe that teachers and education support personnel (ESP) are consulted on what technologies they want and need. This finding indicates that digital technologies are being introduced unilaterally by school leadership or education authorities without any dialogue with the teachers and ESPs and without any consideration for their professionalism and knowledge.

The global union for public services unions, PSI, is running a project called "Our Digital Future."[18] I am fortunate to work with them on this capacity-building project for unions across the world. Here, the vast majority of unions and shop stewards report that they simply do not know whether public services use algorithmic systems in their personnel management. Across all regions, they also openly discuss that they have never received training on understanding digital technologies, data, and algorithms and how these systems potentially affect wages and working conditions. The fact that digital technologies are embedded in the social is underexposed.

Other observations from Our Digital Future suggest that stricter rules and guidelines are needed in relation to algorithmic systems that are developed in public procurement or through supplier processes. They all indicate that the responsible parties do not have the necessary competencies and processes in place to monitor, assess, and amend the algorithmic systems. They were, in conclusion, too hastily developed and deployed. The void has been created. What will it take to fill it?

Filling the Void

We have identified several probable reasons these algorithmic systems failed. Besides obvious programming or design failures, we can group these reasons into three main categories: public procurement and supplier relations; laws as well as governance processes, requirements, and responsibilities; and competencies. Let's look at each in turn as we problematize them from the perspective of safeguarding public services and jobs in these services.

Public Procurement and Supplier Relations

As part of my research for the report "Digitalization: A Union Action Guide for Public Services, Work, and Workers,"[19] I read a vast number of public procurement guidelines, laws, and regulations.[20] While the focus of these global guidelines and regulations is on opening the markets for procurement bidding and increasing transparency and accountability in the procurement process, very few mention data obligations between the private actors and the public sector or the need to ensure the right to amend algorithmic systems. In a response to an inquiry about these matters, the European Commission stated:

> The EU public procurement Directives regulate the procedures governing purchases by public bodies but do not intervene into the subject of purchases. This refers also to possible data produced within contracts awarded following public procurement procedures. Having said that, due to the very nature of public procurement (purchasing on the open market something a public buyer needs) normally contracts provide that rights to any data created within them remain with the contracting authority.[21]

In other words, in the European Union, it is down to the contracting authority (the public authority) to determine whether data rights, or control and access, should be part of the contract. The same, it seems, will apply to the contracting authority's right to amend the algorithms.

If public authorities rely mostly on the data analyses or the tools designed to do the data analysis marketed to them by private companies, then their scope for developing their own datasets and interpretations of the data findings disappears. This overreliance on the private sector locks the public authorities into a dependency relation, characterized by an uneven access not only to information but also to the knowledge that can be derived from these data.[22] A vicious cycle is formed, where the capacity building inside public authorities to gather, understand, store, and make use of data lags behind that of private actors, leading to a further dependency on the private sector and less capacity building, and so on. As Mulligan and Bamber so precisely write:

> These [machine learning] systems frequently displace discretion previously exercised by policymakers or individual front-end government employees with an opaque logic that bears no resemblance to the reasoning processes of agency personnel. However, because agencies acquire these systems through government procurement processes, they and the public have little input into—or even knowledge about—their design or how well that design aligns with public goals and values.[23]

This passage perfectly mirrors some of the observations we made. The knowledge gaps between developers, vendors, and contracting authorities, as well as between the public service departments affected by the algorithmic systems and those negotiating the procurement/partnering contracts create a void of unanswered questions: What are the individual and collective risks involved in using digital technology? What mitigations need to be made to overcome bias and discriminations in the technology? What problems can or will the technology solve? Is the tool's risk-and-rights-impact profile proportionate to its use? What data is generated and extracted and what privacy preserving measures need to be in place to ensure responsible joint data access and control? Is the problem at hand better solved through nontechnical means?

To fill this void and to protect the autonomy of public services and well as the rights of public services workers, procurement guidelines and laws should be amended to include the following:

- The justifications for developing or deploying an algorithmic system.
- Clauses guaranteeing, at minimum, joint data access and control between contracting authority and private entity.
- The contracting authority's right at all times to amend the algorithm should harms or other unintended impact be identified (i.e., a ban on private companies' ability to hide the source code).
- Obligatory risk and rights impact assessments conducted by the developers of the algorithmic systems. These assessments should follow the system just as an instruction manual follows a good.
- Clear agreements on monitoring and impact assessment duties between the two parties. Assessments must be reviewed periodically and must be concerned not just with risks but also with rights (human rights, social rights, workers' rights).
- A committee of multiple voices overseeing and participating in monitoring and assessment. This committee should include workers from the relevant department who will be using the tool or are subject to the tool, the contracting authority negotiation team, IT experts, and union representatives, as well as the vendors and developers. For algorithmic systems aimed at improving public services, representatives of the subjects of these systems (for example, citizen groups) should also be included on the committee.

- Full disclosure and transparency requirements over the systems designed and their purpose and data handling. These requirements should be made publicly available and should include clear contact points.
- Stringent demands to the private company forbidding the repurposing and selling of the data extracted and generated through the task or system at hand.

Governance

Many of the suggestions in the preceding list allude to the need for establishing governance procedures and requirements for algorithmic systems. Several initiatives are on their way, others already passed into law.[24] This section focuses on laws related to the workplace that have been enacted or are pending, several of which are highly relevant at the moment.

In California on March 15, 2022, the California Fair Employment & Housing Council (FEHC) put out a document entitled "Draft Modifications to Employment Regulations Regarding Automated Decision Systems."[25] The draft regulations would revise the state's nondiscrimination laws with regard to employers and employment agencies that use or sell employment screening tools and services with artificial intelligence (AI), machine learning, and automated decision-making. The document states that it would be unlawful for an employer or its agents to "use qualification standards, employment tests, automated-decision systems, or other selection criteria that screen out or tend to screen out an applicant or employee or a class of applicants or employees on the basis of a characteristic protected by this Act."

In New York, a new automated hiring bill requires that a bias audit be conducted on an automated employment decision tool before the tool is used.[26] The bill would also require that candidates or employees who reside in the city be notified about the use of such tools in the assessment or evaluation for hire or promotion and that they be notified about the job qualifications and characteristics that will be used by the automated employment decision tool. Violations of the provisions of the bill would be subject to a civil penalty. There is no mention in the bill of who will be conducting the bias audit or whether it shall include multiple stakeholders, such as representatives of current and prospective employees.

The Canadian government has introduced an algorithmic impact assessment (AIA) in the form of a questionnaire that determines the impact level of an automated decision-system.[27] The tool was developed to help organizations "better understand and mitigate the risks associated with Automated Decision-Making (ADM)." It consists of forty-eight risk and thirty-three mitigation questions. Assessment scores are based on many factors, including systems design, algorithm, decision type, impact, and data. Though a very positive initiative, the AIA has some considerable deficiencies. It is not required to be revisited periodically. Workers are not mentioned as actors.

In the European Union, the draft EU AI Act confirms that algorithmic systems directed at employment, management of workers, and access to self-employment (e.g., CV-sorting software for recruitment procedures) should be regarded as high-risk applications and that these should be subject to strict obligations before they can be put on the market. These include

- adequate risk assessment and mitigation systems;
- high quality of the datasets feeding the system to minimise risks and discriminatory outcomes;
- logging of activity to ensure traceability of results;
- detailed documentation providing all information necessary on the system and its purpose for authorities to assess its compliance;
- clear and adequate information to the user;

- appropriate human oversight measures to minimise risk; and
- high level of robustness, security and accuracy.

In relation to AI systems used for worker management, however, the draft AI Act settles for these strict obligations to be self-assessed by the employers and not subject to external scrutiny. This despite the fact that the act classifies these systems as high-risk systems. To make things worse, workers or their representatives are not by law, or recommendation even, to be party to these risk assessments.

In all four examples, improvements most certainly could be made. Here are a few ideas that feed into the revisions to procurement guidelines mentioned earlier:

- Those who are directly and indirectly subjects of algorithmic systems (workers and members of the public or their representatives) must automatically be party to the assessment process;[28] to this end, a multi-stakeholder body should be formed.
- These assessments must also include risks to fundamental human rights, freedoms, and autonomy.
- Assessments should be made before a new algorithmic system is introduced (ex ante) and periodically after (ex post).
- Assessments should be made available to those who are subject to the system or systems upon request.
- A dedicated, independent authority should be established to oversee assessments and any amendments made to the algorithmic systems by the multi-stakeholder bodies; this to ensure legal compliance.
- Rights of redress for workers and members of the public should be clearly defined.
- So, too, should it be made very clear to whom workers and members of the public should turn with concerns or complaints, that is, there should be a public and clear map of responsible parties.
- Included in this governance process should be strong collective data rights for workers and members of the public, including the right of access, rectification, and deletion, as well as the right to prohibit the repurposing and selling of any extracted or generated personal data or personally identifiable information.

With these additional requirements, an ecosystem will be created that values fundamental human rights, freedoms, and autonomy over apparent efficiency gains. No impact assessment can in all seriousness be conducted by one party alone. Rights must be clearly defined and enacted. All humans must have the right to be free from algorithmic manipulation, or as Penn argues, we should have the right to "algorithmic silence."[29] So-called black box algorithmic systems, where scrutiny of the systems is limited, should be forbidden in systems that manipulate the life and career chances of individuals.

Alarmingly, however, there is little evidence that governance requirements, even templates that contain the measures listed earlier, are on the regulatory agenda. Rather, in the G7, in the European Union, and in multilateral trade agreements (OECD Digital Trade), governments seem to be striving toward AI standards or certification mechanisms that at best include weak governance requirements.[30]

Yet those working on the intersection of technology and society are asking for tools and guidelines. Greene summarizes the insights she has drawn from leading Partnership on AI's multi-stakeholder Affective Computing and Ethics project:

> Technical experts wanted a decision-making or process improvement tool, to broaden their discussions and networks, and to create guardrails for technology they had developed. . . .

Non-technical participants also often felt that they did not know enough about how the technology worked or where and how it was being used to be able to apply their expertise.[31]

We now turn to the key issue of competencies.

Competencies

To ensure the future of quality public services and decent work, public services must fully realize the power of algorithmic systems, question their relevance, and engage in rigorous multi-stakeholder governance processes. Also, they must adopt improved public procurement processes and negotiate around data access and control and their right at all times to amend the algorithm or algorithms if harms are detected. These requirements, if done well, will have at their core a goal to protect human rights, freedoms, and autonomy. Included also should be assurance that the contracting authorities as well as the stakeholders (workers, members of the public) have the necessary competencies to engage in these negotiations and governance discussions. Little, unfortunately, indicates that workers, members of the public, and the public services have these competencies.

If we think about it, many of us have never received training or information about how digital tools work. Why are many tools free? What are we paying with? Who controls our data? What is data? Where do all these recommendations come from—from what "others" have bought, from online dating app "matches," or from the verdict about your credit score? We simply "don't know, what we don't know." We cannot know what demands we should make to algorithmic systems at work, if we don't understand how potential harms (and benefits) are caused by them.

Many trade unions I work with say exactly this: "We never knew." Some unions are drafting plans to train specialized "digital shop stewards." Just as many trade unions have dedicated health and safety representatives, so should they have dedicated digital representatives. Others are looking into revamping their shop steward education. And still others are diving straight into collective bargaining. Public Services International is developing a digital bargaining database—a repository of collective bargaining clauses and guidelines related to the digitalization of work. Educational International is creating an online MOOC for their members on the digitalization of education. Unions are filling a knowledge gap that they have realized is in urgent need of filling.

Greene finds similar knowledge gaps in her work. In some of the examples of bad algorithmic systems that opened this article, we saw that nobody knew what they should—or could—be doing or demanding because nothing was written down and nothing had become institutionalized knowledge.[32] I call this "managerial fuzz." It comes about because of the depth and breadth of the algorithmic systems we have been discussing. The existence of managerial fuzz calls for much clearer divisions of responsibilities and knowledge sharing between IT departments, data analyses departments, HR departments, and the managers responsible for wanting the systems in the first place and for negotiating supplier/procurement contracts. In this mix, workers must be found. The response to managerial fuzz needs to be multidisciplinary. One striking assumption in most debates about or models on AI ethics is that management knows what they are dealing with. In my conversations with business leaders and public sector managers, they blankly admit that managerial fuzz abounds. If digital technologies are governed at all, they are done so exclusively from a risk perspective: risk of hacking, data breach, cyber security, and so forth. Assuming that managers have learned to govern algorithmic systems from an ethical perspective that upholds fundamental human rights, freedoms, and autonomy is—to be frank—not only wrong but also dangerous.

A third group in need of capacity building are the developers of these digital technologies and algorithmic systems. Many AI ethicists point to the need for developers to be trained in ethical thinking.[33] Rights and risks assessments should be made by them too, and their assessments should follow the systems they sell the way an instruction manual follows a good. Vendors and deployers of the systems should become familiar with the developer's assessment and cross check their own with it.

So, from developer to vendor to deployer and to the workers and members of the public concerned, capacity building is required. There is no one-size-fits-all course that all can participate in. Some regard ethics as a means to avoid regulation. "Ethics washing," the act of weaponizing ethics in support of deregulation, self-regulation, or hands-off governance, is on the rise.[34] Others define ethics in a more socially justifiable way—sharing benefits and risks and mutually determining what is morally good and bad and morally right and wrong.

All actors involved need to debate what ethics and human rights, freedoms, and autonomy mean to them. But because what is right for one group might not be right for another, to reach consensus, all parties must engage in dialogue. Once again, those multi-stakeholder governance bodies are needed. All actors in those bodies need a general understanding of what makes digital technologies and algorithmic systems so much different from their analogue ancestors. It is therefore of utmost importance that all the laws and guidelines currently being enacted that do not include multi-stakeholder governance processes are regarded as incomplete.

Toward a Rights-Based Digital Ecosystem

If the prospect of getting things right seems daunting, the alternative is still far worse. In many ways, the recommendations offered here can, with some vigor, become institutionalized practices. Amending procurement and supplier contracts and processes to ensure the future autonomy of public services as well as the human rights, freedoms, and autonomy of individuals is not hard. It takes political will. Ensuring that all algorithmic systems are co-governed to prevent harm and promote fundamental human rights, freedoms, and autonomy is also a question of political will. So is recognizing and enforcing the freedom of association and the right to collective bargaining. Union busting is a crime that violates the fundamental freedoms enshrined in law. To this end, the Council of Europe's project "Towards an Application of AI Based on Human Rights, the Rule of Law, and Democracy" is promising.[35] A recent publication by Leslie and colleagues for the council offers many potential avenues for pursuing an assurance framework for AI systems, or as we have called them, "algorithmic systems."[36] One thing is clear, though, governments must rethink their policies and include stringent multi-stakeholder governance requirements that promote our fundamental human rights, freedoms, and autonomy and that include multiple voices.

The larger task is to make sure that all of those subject to, developing, selling, or deploying algorithmic systems actually have the sociotechnical knowledge they need to ensure that fundamental human rights, freedoms, and autonomy are respected. It will take time and a coordinated effort reaching from raising public awareness to including all things digital in elementary education right up to university degree curricula. It will take funding and a whole bunch of well-informed individuals to begin this capacity building of the wider population. Unions have a key role to play in defending workers' rights and in supporting workers and their representatives in relation to the governance of algorithmic systems. To this end, I developed, with helpful input from the UC Berkeley Labor Center, "Co-Governance of Algorithmic Systems: A Guide."[37] The UC Berkeley Labor Center has also published an insightful report titled "Data and Algorithms at Work: The Case for Worker Technology Rights," which supplements this guide perfectly.[38] By adopting a critical digital agenda and actively pushing

for change through collective agreements and political advocacy, unions could well be ensuring their own future. But prioritizing a critical digital agenda at a time when worker's rights are extensively being violated, stretching unions far and wide will require resources many unions are struggling to find. But if the current void is allowed to persist, the commodification of work and workers will continue unfettered. If this void is not challenged, the question is whether there will be a role for unions in the not-so-distant future.

Essentially, a rights-based digital ecosystem rests on the human rights laws many countries have adopted. In the mother of all of these laws, the 1948 Universal Declaration of Human Rights, article 1 states: "All human beings are born free and equal in dignity and rights."[39] If this article were respected, manipulative and discriminative algorithmic systems that strip groups of workers or members of the public of their autonomy, freedom, and rights would be outright forbidden. To ensure democracy, quality public services, and decent work for generations to come, we must therefore build a digital eco-system that is rights-based and inclusive. We cannot afford not to.

Notes

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