

The Digital Revolution: Social and Ethical Concerns

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NS is an international co-operation initiative led by the Honourable Jocelyne Bourgon P.C., O.C.



Insights from PGI Literature Review on the 4th Technological Revolution

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The NS Initiative is a collaborative international research initiative that was launched in 2009 with the explicit purpose of exploring the new frontiers of public administration to provide practitioners with a mental map adapted to the challenges of serving in the 21st century. Seeking insights from theory and practice, and testing ideas in a diversity of environments are a trademark of the NS Initiative. PGI's 2019 research program is working on a variety of factors that are transforming the economic, social, technological, environmental and political spheres of life in society. The first literature review focused on the digital revolution and the velocity of change. This second literature review focuses on the social and ethical concerns of the digital revolution.

In 2009, when celebrating the 150th anniversary of Darwin's **On the Origin of Species**, a noted socio-biologist, E.O Wilson (2009) was asked whether humanity would solve the crises of the next hundred years. He replied: *"yes, if we are honest and smart...The real problem of humanity is the following: we have paleolithic emotions; medieval institutions; and god-like technology. And it is terrifically dangerous, and it is now approaching a point of crisis overall."*

The nature of technological change is such that innovation often precedes regulation. What is different about governing in the 21st century, however, is the rapidity with which innovation is outpacing current ethical guidelines and rules, leaving societies vulnerable to the exigencies of technological advancement. As Turner (2017) describes, *"AI is already being given ownership of difficult decisions that have until now rested on human intuition or principles—actions and doctrines that have been legally codified...If a human were to make these decisions, they would be held to a legal or moral standard. No such rules exist in the wild west of AI."*

A body of work is emerging that shares an interest in distilling the broader impact of disruptive technologies like AI on society and harnessing it for the benefit of humanity. Think tanks and not-for profit organizations,

policy papers, opinion pieces and interviews by academics and ethicists raise concerns about the ethical values embedded within AI, and the "digital sovereignty" of corporations and their coders making decisions on behalf of humanity.

A Lack of Public Awareness and Concern

Cambridge Analytica's interference in the UK and US elections, Facebook hosting fake Russian accounts, and the co-opting of the Yellow Vest movement in France by outsiders to push their political agenda on Twitter - provides context to some of the concerns raised by authors about the ease with which technology can be deployed to spread disinformation, ignite political unrest, and influence the shape and content of digital citizenship. Some former tech executives and tech ethicists advocate for the coming together of citizens, families and civil society more broadly toward the ethical and humane design and use of technology.

Concerned about the limited research effort toward understanding the implications of AI for society, several academic research institutes have emerged dedicated to examining the challenges associated with AI. Chief among their concerns are:

- A lack of transparency;
- Poor accountability for decision-making;
- Bias that may result from the use of automated tools, algorithms and computer learning; and
- Unethical applications of AI.

Data and Algorithmic Bias

Several authors have raised concerns about the risk that machine learning algorithms introduce and amplify social biases, and thus they themselves become a source of discrimination. Historical data sets are integrated into new Big Data systems, and along with them, the biases of the past. The result is that automated data-driven decision-making can (re-)produce inaccurate, unfair, or discriminatory decisions. As Hume et al (2018) explain, “[e]ven subtle and unconscious bias can produce data that steers systems in directions their designers would never choose...Algorithms powered by that data are not objective oracles, but mathematical tools that may pick up, refract and amplify the biases that exist in society.” These concerns will only grow “as algorithms grow more complex, autonomous and powerful.”

Related to these concerns, is the extent to which, programmers either knowingly or otherwise build in misinformation and bias. Some suggest that the AI industry itself is unrepresentative of the population, which may act as a source of unconscious bias.

The “Black Box Problem”

The “Black Box Problem,” also known as the “Responsibility Gap,” refers to the inability to explain how an algorithm arrived at a particular response using a given data set. Since “many deep learning systems function as ‘black boxes’,...their behaviour can be difficult to interpret and explain, thus raising concerns over explainability, transparency and human control.”

While “the black box problem is not new to computer science the rise of advanced AI in the age of big data has caused a cardinal shift in its manifestation. According to the most renowned experts, tracing and understanding in detail the complex decision-making mechanisms of AI algorithms will be difficult.”

Some suggest the need for a broader understanding of explainability. For instance, The Institute for Ethical AI & Machine Learning introduces the notion of a reasonable level of explainability, which considers the processes, infrastructure and humans operating the algorithms, and depends on cross-functional collaboration across technology, industry and public policy domains.

The Value and Ownership of Data

Data holds great economic potential, and AI is the key to unlocking its potential. Often referred to as “Big Data” and described as the 21st century’s oil or gold, data is the new commodity that can be tapped for profit.

The marketization of raw data - from heartbeats to “likes” - that is captured, held and sold is often referred to as the data-driven economy. Supporting the data-driven economy is the development of a data analytics industry. Public and private sector leaders are urged to build data analytics into their organizations, and hire Chief Data Officers. They are warned that organizations that rely solely on experience, intuition and judgement in decision-making are at risk of being left behind. Private, public and academic institutions have begun to establish data analytics academies to turn out the “unicorns” - data analysts with a combination of business and analytics skills - to harvest, analyze, interpret, and make predictions about the data.

The economic value of data is “galvanizing

entrepreneurs and investors.” Some authors warn that the prospect of “extracting lucrative insights” -coupled with the lack of ethical and regulatory frameworks, is at risk of contributing to inequalities, marginalization, and abuses of power.

The question of ownership of data circles around the role of government in ensuring that society benefits from all that the digital era has to offer, while at the same time ensuring that it is contributing to the collective interest. This raises important questions about the stewardship role of the state, which includes, but is not limited to, regulatory power; how to anticipate risks and proactively prevent harm; how to regulate without losing the benefit of enhanced knowledge; and how to define the boundaries of data ownership and use between the public, private, civic and individual spheres of life.

The Ethical Application of AI

The lack of accountability for how AI technology is procured, deployed and used raises a variety of concerns. Some authors suggest the need for Algorithmic Impact Assessments, similar to Privacy Impact Assessments, as a means of introducing accountability into decision-making around the broader application and adoption of AI.

Of particular concern for some is the growing use of AI for surveillance via sensor networks, social media tracking, facial recognition, and affect recognition. The technology, often used without people’s consent or knowledge, has the potential for unethical and discriminatory purposes, thus raising concerns around the violation of human rights. Some oppose the use of facial recognition by governments, while others call for strict regulations around its use.

Comments:

This work draws attention to some of the challenges for governments in the development and adoption of AI, and the algorithms and data that fuel it; among them are accountability and transparency for AI decision-making, the “blackbox” and the associated risks of machine learning bias, and the ethical use of AI technologies. Some voices argue that in a field that is evolving, the certitude of these concerns is unproven, that regulating risks contributes to stifling innovation, or missing the true challenges of AI. Others call for governments to take action now: to regulate while the industry is still in its infancy, noting that the risks of waiting for the field to advance are too grave, and the challenges of regulating down the road too great. Governments do not have the luxury of waiting to take action with imperfect knowledge. Different countries are taking different paths. This will be the focus of the next phase of PGI literature review.

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