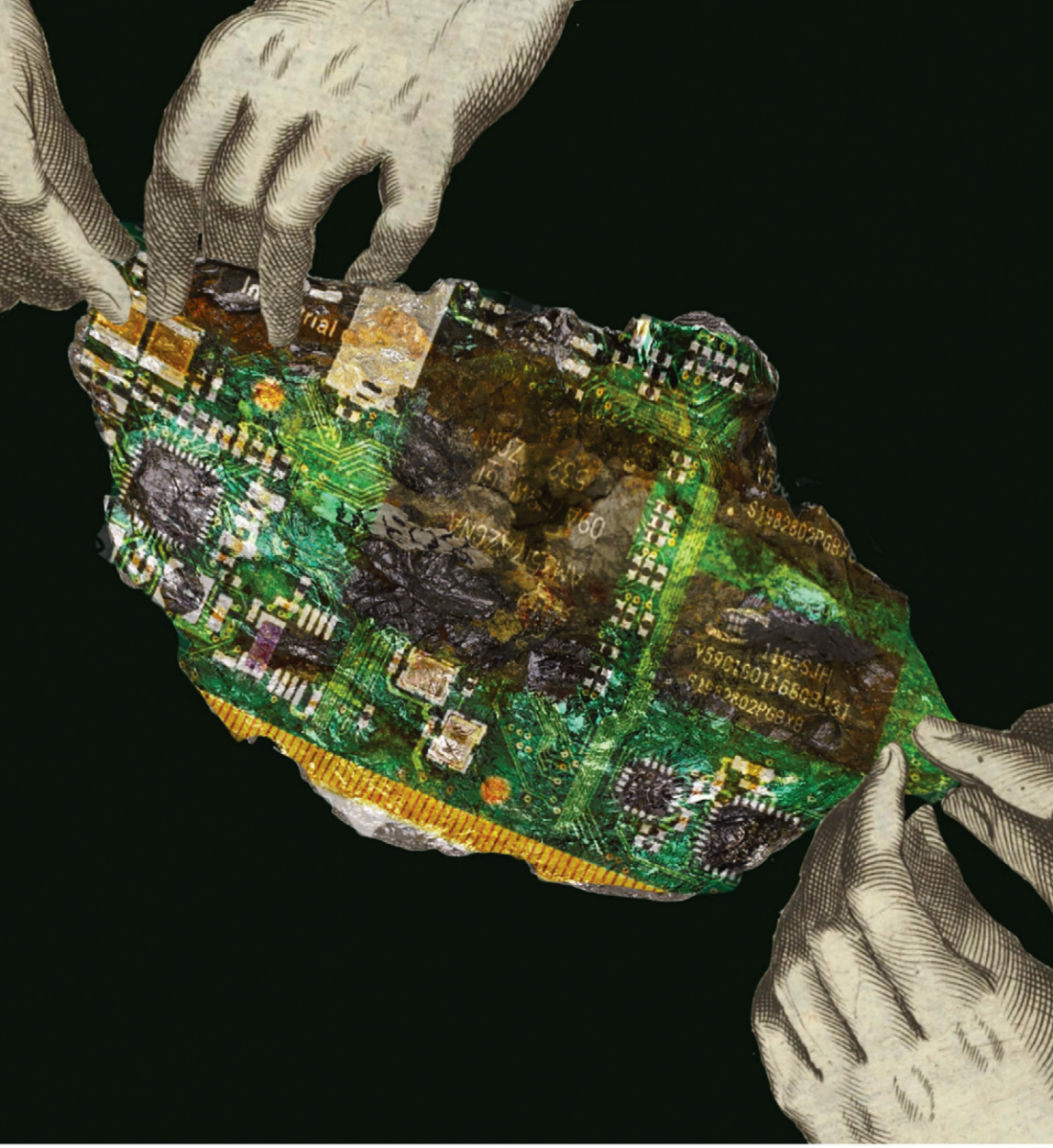


Digital Materialities and Sustainable Futures

PLATFORMS AND THE PLANET

Big Tech, Digital Platforms and Environmental Responsibility

Edited by

SALLA-MAARIA LAAKSONEN, MERVI PANTTI & OLGA DOVBYSH

Platforms and the Planet

DIGITAL MATERIALITIES AND SUSTAINABLE FUTURES

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The materiality of digital technologies can inflict substantial environmental damages: the ever-growing extraction of resources needed to produce digital devices; the toxicity of e-waste; and the rapidly increasing energy demands of data centres, needed to sustain every click, website, database or 'smart' network. And yet, the geography of digital environmental harms is unevenly distributed and is often aligned with geographies of colonialism, land dispossession, extraction of natural and human resources, and the violence of industrialisation and capitalism. As digital economies grow at an unprecedented speed, the links between global environmental degradation and digital industries become more apparent, as does their intersection with global environmental injustice. However, when these questions are addressed, they are typically framed as problems of cost and efficiency where the environment is simply seen to provide material condition for the operation of digital economy.

Digital Materialities and Sustainable Futures develops an interdisciplinary field that shifts the conversation about digital environmental sustainability from profit and efficiency to geographies of in/justice and the colonially and decolonisation of digital scholarship and practice.

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Platforms and the Planet: Big Tech, Digital Platforms and Environmental Responsibility

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INVESTOR IN PEOPLE

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The initial idea for this book was born in watercooler discussions related to a research project focused on the accountability of digital media platforms. In the middle of growing awareness of the climate crisis as a global, escalating disaster (Ripple et al., 2024), we wanted to turn our gaze to the complex issue of environmental sustainability of digital technology and most notably, the platform companies. Luckily, we did not have to start from scratch, but we were able to reach out to many scholars who had already been pioneering in the field.

This book brings together a marvellous group of scholars across the globe. The original ideas for the chapters were based on ideas presented by the authors themselves, and they are based on ongoing empirical work and critical thinking. We would like to express our gratitude to all the authors who patiently applied and responded to our suggestions and comments. We also owe to the external reviewers who commented on some of the chapters, as well as to the editorial team at Emerald. As editors, we learned a lot during the process, and we sincerely hope our readers will have the same experience!

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Introduction: Conceptualising and Theorising the Environmental Responsibility of Digital Platforms

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Abstract

Digital technology is often considered a green and sustainable alternative and a solution to the climate crisis. However, emerging academic and public discussions highlight that digital platforms and the devices on which we use them have severe environmental consequences through, for instance, their escalating energy consumption, material resource use and the production of hazardous waste. This book seeks to develop a critical understanding of the environmental responsibility and accountability of digital platforms. It focuses on the environmental responsibility of digital media platforms and their role in the environmental sustainability transition as a discursive, material and ethical question. Overall, the book bridges critical platform studies with environmental studies and environmental communication studies, providing a multifaceted view of the dynamic relations between digital platforms and the environment. Empirically, the book also expands the perspective beyond Western platform companies by including evidence from the Global South, China and Russia for a more nuanced understanding of the platforms' power in relation to the planet.

Keywords: Digital media platforms; environmental sustainability; platform power; social accountability; digital materiality; responsibility discourses

Introduction

Digital technology is often considered an enabler and driver for solving major global challenges, such as climate change or the sustainability transition.

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Likewise, digital media platforms, social media services offered by the so-called Big Tech companies, have been considered to offer a less wasteful way to consume media and participate in society through public communication. However, emerging academic and public discussions highlight that digital platforms, the devices on which we use them and the growing data centre industry are contributing to the climate crisis through, for instance, their escalating energy and water consumption and the production of hazardous waste (e.g., Arcieri, 2022; Brevini & Doctor, 2023; Edwards et al., 2024; Freitag et al., 2021; Hogan, 2018; Istrate et al., 2024; Lucivero, 2020; Parikka, 2015). The share of greenhouse gas (GHG) emissions of the entire information and communication technology (ICT) sector in terms of global emissions has exceeded that of the widely discussed air traffic sector, and the share is estimated to multiply in the coming years (World Bank & ITU, 2024). This is due to the downstream emissions caused by the growing use of digital services as well as increasingly computation-heavy technologies such as artificial intelligence (AI; see Crawford, 2021). Similarly, platform companies' emissions continue to rise despite their increasing investments in green technologies (Arcieri, 2022). This phenomenon is known as the Jevons paradox: as technological advancement increases efficiency, resource consumption rises (Alcott, 2005).

Despite the increasing awareness, the environmental responsibility of digital platforms is a topic that has been only rarely explored by scholars (Kannengießer & McCurdy, 2021; Kuntsman & Rattle, 2019; Kuntsman, 2020). The environmental footprint of digital technologies and platforms is difficult to observe, trace and measure (Laaksonen & Premsankar, *this volume*). The environmental impacts of digitalisation are often distant from a consumer's perspective: the digital services can be produced in data centres on the other side of the globe, and the energy required for data transfer is not made tangible to the consumer charging their smartphone. The e-waste resulting from outdated consumer devices and servers is exported to third-world countries, where hazardous materials cause environmental and health damage to local communities. In economic and environmental studies, the concept of environmental externality has been classically used to denote the side effects that impact third parties outside the primary economic activity (Buchanan & Stubblebine, 1962). In the platform economy, the environmental consequences are formed in a global ecosystem where harms are externalised from the Global North, who are the main consumers of digital services (e.g., Andreucci et al., 2023; Brodie, 2023; Parikka, 2015) and who are, more generally, responsible for the majority of GHG. While the impacts of climate change manifest globally, developing countries in the Global South face disproportionate risks of climate change–related natural disasters and threats to public health and lives. The inaction of developed nations and their disregard for the Global South reinforce existing and create new inequalities and colonial-era power dynamics (Mejias & Couldry, 2024; Pantti & Karell, *this volume*).

The platforms themselves mostly remain silent about the environmental harm and injustice related to their actions. Instead, the amalgamation of green and digital evident in the societal discourses on green and digital transition is also

prominent in the ways in which technology companies themselves construct their social and environmental responsibilities: their sustainability reports, news releases and blog posts talk about their efforts to build a greener world (Frig et al., *this volume*). Overall, in the corporate and political sustainability discourse, the development of digital technologies is often approached from a solution-centric perspective, assuming that there are unproblematic technological solutions to societal problems (Kuntsman & Rattle, 2019; Morozov, 2014). Consequently, digital technologies are often presented as a means to save energy and reduce carbon emissions, even if current evidence suggests that the use of digital technology is growing faster than its energy efficiency (Freitag et al., 2021).

This edited volume focuses on the environmental responsibility of digital media platforms and their role in the environmental sustainability transition as a discursive, material and ethical question. Taking a critical and cross-disciplinary perspective, the book centres on platforms because of their global infrastructural power and their growing role in climate politics: not only as a communication infrastructure enabling our climate-related discussions and our digital economy but also as corporations with a political and moral responsibility for the development of our society. Therefore, we argue that it is essential to address digital platforms, and the Big Tech companies offering them, as key infrastructural and political actors in environmental sustainability, as well as to study their environmental impact in the context of rapidly increasing digital media consumption.

To unravel the complex relations that constitute the environmental responsibility of digital platforms, the chapters in this book seek to engage with this topic from three broad perspectives: first, by laying out the premises and causes of the environmental (un)sustainability of digital platforms; second, by unpacking the digital materiality of platforms as an infrastructure; and third, by investigating the discourses of responsibility around platforms and environmental sustainability. Therefore, while our focus is on the somewhat abstract notion of 'platform companies', the perspectives covered in the book also include other actors in the platform assemblage: users, activists, technology designers, regulators, as well as the broader society increasingly intertwined with the platforms. Yet, in the picture we paint together with all the chapter authors, the main targets of accountability demands are the platform companies.

In this introduction chapter, we first lay out the premises for platform power when it comes to environmental sustainability: their infrastructural power position in our society and the context of platform capitalism. Next, we discuss the material aspects of the digital platform society, and how they feed into the importance of studying platform accountability both as an ethical and discursive question. Finally, we present the book content by summarising each section and chapters that belong to it: (1) unpacking environmental sustainability, (2) infrastructures and materiality and (3) discourses of accountability.

Platforms Are Powerful – And Capitalistic

The role of transnational platform companies as providers of digital media infrastructure has been widely recognised (e.g., Plantin et al., 2018; van Dijck, 2021). These companies are now argued to hold major infrastructural power positions in society through their role in not only mediating public communication and occupying people's everyday lives (Helberger et al., 2018; Plantin et al., 2018) but also in deeper transformations of social practices and relations of individuals and organisations (e.g., van Dijck et al., 2018). Platform companies, as controllers of digital infrastructures, can influence the behaviours of other actors and markets by setting standards and rules and moulding the institutional environment (Khanal et al., 2024; Laaksonen et al., 2024; Nieborg et al., 2024; Srnicek, 2017; van Dijck et al., 2018). In scholarship, this development and form of power is typically called platformisation (e.g., van Dijck et al., 2018).

Further, in their capacity as informational intermediaries, digital platforms exercise a unique form of opinion power, which enables them to command online attention, set the agenda and use data and algorithmic tools to steer public discussion (Helberger, 2020; van Dijck & Poell, 2015). Instead of a public space shared by all, social media generates personal 'public sphericules' that cater for the interests of the particular user (e.g., Willson, 2014), supported by platform algorithms programmed to support the business logic of the platforms. Also, the public discussions on environmental sustainability and related activism are subject to these algorithmic logics, which highlights platforms' power in shaping our shared understandings of the climate crisis.

Apart from playing a major role in the distribution and circulation of media content, some platform companies also have a more hidden role as providers of server infrastructure and computing services (notably Amazon, Google, and Microsoft). By storing the data and running the software and calculations of other actors in the digital economy, these players play a powerful role as the backbone of the entire platform society. Digital technology is the pervasive infrastructure of the modern economy (Srnicek, 2017). Once adopted and integrated, leaving these infrastructures is made difficult, which further consolidates their power (Bartlett & Velkova, *this volume*; Brevini & Swiatek, 2020; Lehdonvirta, 2022). Arguably, such power is even more difficult to curb and regulate, and nearly impossible to circumvent as an individual user. It has been suggested that infrastructural cloud arrangements, specifically, drive market domination and rapid expansion in the platform economy (Narayan, 2022). The capital accumulation of platforms is built around data extraction and control, as well as network effects based on a growing user base, which further supports the centralisation of power and the development of a monopolistic market (e.g., Narayan, 2022; Srnicek, 2017).

Platforms Are Exploitative

Platforms feed on data. In platform capitalism, quality data are essential for the business models of the platforms (Srnicek, 2017; Van Dijck et al., 2018). Just as

capitalism was made possible by the extraction of cheap natural resources (e.g., Moore, 2015), platform capitalism is made possible through the extraction and appropriation of seemingly free and intangible data from human users (Narayan, 2022). These datasets are born through data relations, where human relations are appropriated and datafied for commodification (Alaimo & Kallinikos, 2024; Couldry & Mejias, 2018; Mejias & Couldry, 2024). Couldry and Mejias (2018) call this novel form of colonialism *data colonialism* and argue that by generating such data relations, social media platforms reinforce existing colonial power structures. A central tenet of this development is the normalisation of exploitation of human beings through data, 'new type of appropriation that works at every point in space where people or things are attached to today's infrastructures of connection' (Couldry & Mejias, 2018, p. 337).

This new form of colonialism is digital but at the same time territorial. Most of the data extracted is controlled by companies either in the United States or in China, regardless of their origin, which means that the wealth accumulates in these regions. The data flows, thus, are global, but the practices of processing the data are embedded in arrangements of global inequality. For example, platform capitalism has given rise to new kinds of platform and data labour needed to keep the platforms' automation working and their content clean. This kind of data work is typically outsourced to the Global South, with well-known examples of content labelling in Kenya or in the Philippines (Holden & Harsh, 2024; Roberts, 2019).

In platform capitalism, thus, human beings are not only appropriated through their data but also through existing economic inequalities related to territorial and global arrangements. Despite this, introducing digital technologies and platform capitalism to the Global South has been considered progress and inclusion (Arora, 2016). For example, Facebook's Free Basics programme (Nothias, 2020) was advertised as 'connecting the unconnected', but from a business perspective, it worked to secure a first mover advantage and conquer a new customer base. Platforms, thus, are reproducing colonialistic, symbolic and material structures and power dynamics (e.g., Kumar, 2024). Another, more subtle way in which this reproduction takes place is that most social media platforms are technologies designed in the Global North and, hence, their design imposes values and worldviews dominant to those cultures (Irani et al., 2020; Olsson, *this volume*; Winner, 1980).

Being among the biggest corporate actors globally, platform companies also have political power. They have become increasingly important in policy processes, allowing them, for instance, by lobbying, to push or prevent policy changes to serve their economic interests (Cohen, 2019; Gorwa et al., 2024). Recent scholarship has discussed platform companies' power in terms of their expansion into new social areas due to their market power and digital expertise (Sharon & Gellert, 2024; van Dijck et al., 2018). AI models and applications, for example, further bolster platform companies' power and expansion across social domains (Kak et al., 2023). However, the lobbying efforts of platform companies towards global climate change, such as meeting the Paris Agreement's goals, are

insignificant compared to their political capital and tend to have a 'net zero' influence over climate policy (Big Tech and Climate Policy, 2021).

Platforms Are Material

An essential aspect in understanding the environmental sustainability and responsibility of digital platforms is their materiality, not only in terms of them being the infrastructure that defines how our communication flows materialise in society but also in terms of the materials needed to build and maintain them (e.g., Haider et al., 2022; Mahnke, *this volume*). As Larkin (2013) puts it, 'Infrastructures are matter that enable the movement of other matter' (p. 329). However, they become invisible in our everyday relations and assimilate into the background, as infrastructures typically do (Star, 1999). Infrastructures are invisible yet opaque: we are used to thinking of infrastructures as something very concrete, such as the railway system or electricity network, but digital communication infrastructure escapes this logic. For the everyday user, the material nature of the digital platform infrastructure is reduced to the devices used to access the services. Larger structures, such as data centres, servers, 4G networks and cables, are out of sight, perhaps even on a different continent.

However, building these infrastructures requires land, water, energy and raw materials, including the rare minerals needed for chips and batteries (e.g., Brevini & Doctor, 2023; Brodie, 2023; Crawford, 2021; Parks et al., 2023; Pasek et al., 2023). As suggested by Kannengießer and McCurdy (2021), studies of digital media should take into account three dimensions of materials: resources, energy and e-waste. These three dimensions aim to cover the material lifecycle of digital media, from the raw materials needed to manufacture the technology to the energy needed to keep it running and, finally, to the wasteful consequences of the increasingly short lifecycle of technological devices across the infrastructure.

Several scholars have explored the environmental consequences and materiality of data centres (e.g., Brodie, 2023; Edwards et al., 2024; Hogan, 2018; Velkova, 2021) and e-waste (e.g., Bridges & Maphosa, *this volume*; Lepawsky, 2018; Parikka, 2015; Thylstrup, 2019), also highlighting the complex and global interdependencies in the ecosystem of digital technology. The material consequences of platform capitalism are more profoundly experienced in the Global South, as the zones of extraction and residual processing are concentrated in formerly colonised countries (e.g., Andreucci et al., 2023; Bridges & Maphosa, *this volume*). The platform capitalism, thus, reproduces colonial structures of violence (Thylstrup, 2019). What further complicates the picture is the increasing involvement of the platform companies in building the infrastructures of green extractivism, that is, extractivist and exploitative market dynamics of climate adaptation (Brodie, 2024; Bruna, 2023; Hogan, 2018). The platform and other big tech companies are aiming to bolster their role in the green transition by generating relationships between data centres and green electricity, particularly through discursive means.

Furthermore, the platform society has embedded logics that constantly expand its materiality. The logics of platform capitalism (Srnicek, 2017) and the surveillance economy (e.g., Zuboff, 2019) embedded in the digital platform economy generate an imperative for ever-expanding data collection (Fourcade & Healy, 2017; Hogan et al., *this volume*) and so do design solutions that encourage addictive media use (Bhargava & Velasquez, 2021; Olsson, *this volume*). This increasing use is reflected in the growing need for new data storage and calculation facilities, as well as network infrastructure, which all require material resources. As a consequence, scholars need to turn their critical gaze into material objects such as data centres, which are not only unmalleable technical systems but also 'materializations of particular power relations and imaginaries' (Edwards et al., 2024, p. 430). Yet, the language used to discuss digital technology initiatives effectively seeks to hide their materiality (Lucivero, 2020). This juxtaposition reminds us of the importance of studying the social and discursive construction of digital platform technologies.

Platforms Are Accountable

In recent years, the societal roles and responsibilities of digital platforms have become a growing topic of global discussion and increasingly also a target of regulation. Because of their infrastructural positions and accumulated power, platforms can be seen as subject to significant societal obligations (Helberger et al., 2018; Pickard, 2021). They have been increasingly called responsible for their actions in society, ranging from manipulative design and addiction (Bhargava & Velasquez, 2021) to their impact on public political discussions from elections to spreading false information (e.g., Hill, 2020; Pickard, 2021; Tucker et al., 2018).

However, formal processes of holding the platforms accountable for their actions are still only emerging, with the digital regulation acts by the European Union being the spearheading initiatives. Therefore, holding platforms responsible relies on processes of *social accountability*. Social accountability means that the powerful are answerable for their conduct and held responsible for their wrongdoings by various noninstitutional agents (Bovens, 2007). In the context of digital platforms, social accountability refers to the ways in which these agents, such as individual citizens or NGOs, publicly impose accountability on platforms. Their actions are typically discursive by nature, and the generation of public attention and debate is often a necessary requisite for holding any actor accountable.

Paradoxically, processes of social accountability often take place using the same digital media platforms that might themselves be targets of accountability demands. Digital media provide essential resources for citizens to participate in social accountability processes – from combatting organisational mischief to global climate action – to voice their critiques and demands directly at public authorities and private organisations (Chadwick, 2013; Hill, *this volume*; Ojala et al., 2019; Poupin, 2021). However, platform companies own and control the

main online spaces that climate activists depend on to circulate their counter-narratives and amplify their calls for accountability (Kavada et al., 2023). Consequently, when social movements striving for environmental sustainability use digital platforms to manage their visibility and influence public opinion in order to put pressure on companies or regulators, they are forced to concede to platform power (Blum & Uldam, 2024).

Discourses that seek to hold platform companies responsible also invite them to respond. As typical to all companies, the platform companies engage in corporate communication to justify and frame their actions (Basu & Palazzo, 2008; Gillespie, 2010). Sustainability narratives are used to build legitimacy for platform companies as socially responsible actors, obfuscate the actual results of their climate response or delay climate action (Frig et al., *this volume*; Pantti & Karell, *this volume*). Climate change is a complex global problem that requires a range of actors and collaboration across various political domains. Consequently, climate governance actors and scholars alike have urged companies to play a key role in reducing the impact of climate change. While platform companies have, in recent years, shown a growing interest in environmental responsibility, at least in terms of setting climate goals and communicating about them (Arcieri, 2022), critical analyses are needed to unpack the foci, function and impact of platform sustainability discourses.

Mission and Structure of the Book

This book seeks to develop a critical understanding of the environmental responsibility and accountability of digital platforms. The 12 chapters are divided into three broad themes discussed in the previous sections: (1) unpacking environmental sustainability, (2) infrastructures and materiality and (3) discourses of accountability.

The chapters in the first section set the stage for the later chapters by building a broad understanding of the environmental impacts of digital platforms. The chapters do this by moving from a theoretical discussion of human–technology–environment relations to more concrete and empirical questions: the carbon footprint of digital platforms and digital service design and practices that drive overconsumption, as well as the ways proposed to mitigate both of them.

Chapter 1: The eco-materiality of digital platforms, by Martina Skrubbeltrang Mahnke, develops a conceptual framework to critically assess the environmental costs related to digital platforms. The framework is centred around the notion of eco-materiality, which builds on Don Ihde's theories on human–technology relations and seeks to highlight the human–technology–environment relations elemental for digital media practices. The chapter highlights the environmental materiality of digital platforms and frames them as deeply related to and embedded within the natural environment through the dimensions of resources, energy and e-waste. By doing this, the chapter sets the stage to critically understand digital technology from an environmental perspective without forgetting human agency and the related questions of global structural injustice.