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Mitigating Data Colonialism: Emancipatory Opportunities of
Data Spaces in the ECOWAS Region

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Abstract German

Diese Masterarbeit untersucht die Chancen von Data Spaces zur wirtschaftlichen, politischen und gesellschaftlichen Emanzipation in der ECOWAS-Region. Durch die den Datenkapitalismus entstehen neue Formen von Abhängigkeiten und Machtgefügen, die sich unter den Begriffen „Datenkolonialismus“ oder „Datenextraktivismus“ zugeordnet werden können. Dabei dominieren globale digitale Hegemonen wie große Technologiekonzerne, besonders aus den US und China, durch ihre Markt- und Einflussmacht wirtschaftliche, politische und gesellschaftliche Prozesse. Diese Arbeit soll im ersten Schritt den historischen Kontext untersuchen, der zu dieser Form des Kapitalismus geführt hat und dabei die Entstehungsgeschichte heutiger Dependenz nicht außer Acht lassen. Auf dieser Basis sollen die Potenziale von Data Spaces für ECOWAS-Länder zur Erhöhung der Datensouveränität und zur Mitigation globaler digitaler Ausbeutungsverhältnisse untersucht werden.

Zentral für diese Masterarbeit wird der historische Kontext des Kapitalismus sein, der zu immer fortwährenden und sich intensivierenden globalen Ungleichheiten führt. Dafür werde ich den gesellschaftlichen Überbau, die Produktionsweise, Produktivkräfte und Produktivverhältnisse sowohl historisch als auch im Kontext des modernen Datenkapitalismus betrachten. Darauf folgend werde ich eine historische Herleitung der Interessen an Ressourcenausbeutung in Afrika thematisieren, um auf den Digital Scramble for Africa des Datenkapitalismus hinzuweisen.

Ein weiterer Aspekt ist die Untersuchung der technischen und infrastrukturellen Voraussetzungen für die Implementierung von daten-getriebenen Technologien wie Data Spaces in Westafrika. Dies umfasst bestehende digitale Infrastruktur, Internetverfügbarkeit und technologische Kapazitäten der Region. Darüber hinaus werden die sozioökonomischen Bedingungen und der Digital Divide beleuchtet.

Schlussendlich möchte ich mit dieser Arbeit die Notwendigkeit emanzipatorischer Potenziale für West Afrika und die potenziellen wirtschaftlichen, politischen und gesellschaftlichen Vorteile von Data Spaces für lokale Unternehmen und die Zivilgesellschaft untersuchen. Durch die Schaffung eines sicheren und interoperablen Umfelds für den Datenaustausch könnten zum Beispiel neue Geschäftsmöglichkeiten und Innovationen gefördert werden, was die Wettbewerbsfähigkeit der Region stärken und nachhaltige wirtschaftliche Entwicklung unterstützen könnte. Aber auch personenbezogene Datensouveränität könnte zu mehr Selbstbestimmung und verringerter Ausbeutung durch Technologiekonzerne führen.

Methodisch verfolge ich einen qualitativen Ansatz in der Logik der kritischen internationalen Politischen Ökonomie. Auf Basis historischer Kontextualisierung werde ich semi-strukturierte Leitfadeninterviews mit Expert:innen führen, um gebildete Hypothesen kritisch zu hinterfragen und eine Einschätzung zu emanzipatorischen Potenzialen von Data Spaces zu erhalten. Durch diese kritische Reflektion soll es gelingen, konkrete Handlungsempfehlungen für politische Entscheidungsträger:innen, Unternehmen und Bürger:innen in den ECOWAS-Ländern zu formulieren.

Die Relevanz dieser Masterarbeit für die Entwicklungsforschung ergibt sich durch folgende Faktoren: 1. Die Forschung positioniert sich in einem für die Entwicklungsforschung zentralen Strang, der kritischen internationalen politischen Ökonomie; 2. Das Ziel der Masterarbeit ist es, emanzipatorische Potenziale anzudenken und ihre praktische Realisierbarkeit kritisch zu beleuchten; 3. Die Ergebnisse können zu einem innovativen Ansatz zur Förderung wirtschaftlicher, gesellschaftlicher und politischer Entwicklung in der ECOWAS Region beitragen. Die Erkenntnisse könnten zu Strategien für eine gerechtere und nachhaltigere Nutzung digitaler Technologien beitragen, die den spezifischen Bedürfnissen und Bedingungen der Region gerecht werden.

Abstract English

In this master's thesis an examination is presented of the opportunities of data spaces for economic, political, and social emancipation in the ECOWAS region. Data capitalism brings forth new forms of dependencies and power structures like "data colonialism" or "data extractivism". Global digital hegemony such as large technology companies, particularly from the US and China, dominate economic, political, and societal processes through their market power and influence. The first part of this thesis contains a description of the historical context that has led to this form of modern capitalism, considering the historic development of current dependencies. On this basis, the potential of data spaces for ECOWAS countries to increase data sovereignty and mitigate global digital exploitation is considered.

Central to this master's thesis is the historical context of capitalism, which leads to ever ongoing and intensifying global inequalities. For this purpose, consideration is made of the societal superstructure, mode of production, productive forces, and production relations both historically and in the context of data capitalism. In this thesis the historical derivation of

interests in resource exploitation in Africa is also addressed, which led up to the digital scramble for Africa. Moreover, an examination is presented of the technical and infrastructural prerequisites for the implementation of data-driven technologies like data spaces in West Africa. This includes consideration of the existing digital infrastructure, internet availability, and technological capacities of the region. Furthermore, an examination of the socio-economic conditions and the digital divide is shown.

Ultimately, the necessity of emancipatory potentials for West Africa are highlighted and an investigation presented of the potential economic, political, and social benefits of data spaces for local businesses and civil society. For instance, the creation of a secure and interoperable environment for data exchange could promote new business opportunities and innovations, thereby strengthening the region's competitiveness and supporting sustainable economic development. Additionally, personal data sovereignty could lead to greater self-determination and reduced exploitation by established technology companies.

Methodologically a qualitative approach was chosen within the logic of critical international political economy (CIPE). Based on historical-hermeneutic contextualization, semi-structured interviews were held with experts to critically question or verify hypotheses and assess the emancipatory potential of data spaces. Through this critical reflection, recommendations are provided for political decision-makers, businesses, and citizens in ECOWAS countries.

The relevance of this master's thesis for development research is derived from the following factors: 1. The positioning in a central strand of development research, i.e. CIPE; 2. The aim of this master's thesis to consider emancipatory potentials and critically examine their practical feasibility; 3. The contribution of the results to an innovative approach to promoting economic, societal, and political development in the ECOWAS region. The findings could contribute to strategies for a fairer distribution and the use of digital technologies that meet the specific needs and conditions of the region.

1. Introduction to Research Problem

Digitalization is the major driver of modern economies and influences society, the global economy, and the political field (Alemneh and Hastings 2006a; Fuchs and Mosco 2015; Mayer-Schönberger and Ramge 2017a; Zuboff and Schmid 2018) – data and other digital assets have become important in various industries, like manufacturing, tourism, education, healthcare, etc. In Europe, the development of decentral, sovereign ecosystems called data spaces emerged in context of the European Data Strategy. (European Commission 2020b). The European

Commission “aims to make the EU a leader in a data-driven society” via its key pillars for enhancing data-driven technologies while safe-guarding privacy and security. The key pillars are the data governance act, data act, and the digital single market for data (European Commission 2020b). Data Spaces are envisioned as secure and interoperable environments where data can be shared and exchanged among various stakeholders, such as businesses, governments, research institutions, and citizens. Many initiatives have arisen since the early 2010s, when discussions about secure and interoperable data sharing began to gain traction in academic and industry circles – back then the term data spaces was not yet established, and the narrative was focused on cloud computing, big data analytics, and the internet of things (IoT). Data-driven optimizations and collaboration possibilities for data exchange within and across companies and organizations were central motivations. While the exact origins of the term data space may be difficult to trace, its adoption and usage have grown significantly in recent years – many initiatives, lighthouse projects, and organizations developed around this topic and on the basis of how to enable the research-to-market-transition (International Data Spaces Association (IDSA); Gaia-X Association; Big Data Value Association, BDVA; FIWARE Foundation; Common European Data Spaces; nationally funded lighthouse projects like Catena-X, and many more). It is claimed that the concept of trusted data sharing brings benefits across all business domains and societal fields, which is why data spaces are found in a broad spectrum of fields (e.g. Automotive, Manufacturing, Education and Skills, Mobility, Health, etc.). An interesting attribution of the technological concept is that data spaces would be “defending and promoting European values” (European Commission 2020b), while fostering data-driven innovation in Europe in order to close or at least reduce the gap to global digital hegemonies from the US or China. Data sovereignty, economic resilience, and reduced dependencies on so-called hyperscalers are common goals mentioned in the data strategy which should help resolve the “problem of market asymmetry between hyperscale global actors that often offer integrated solutions containing applications also provided by smaller (EU) players” and “generate clarity about the compliance of cloud services with relevant rules“ (European Commission 2020b:19).

As Langdon Winner wrote in 1980, technology is always embedded in the social systems and dynamics in which it is evolving (Winner 1980:130ff). On the basis of that logic, data spaces and data sovereignty will not only reflect European values but will also be influenced by existing social inequalities and power imbalances, potentially reinforcing these dynamics.

In data capitalism, physical relations are transformed into data streams – which resembles the extraction of a resource in the sense of “predatory extractive practices of historical colonialism with the abstract quantification methods of computing” (Couldry and Mejias 2019:337). It is therefore important to critically discuss and elaborate questions about participation in technology development and usage. In data colonialism, there is not one pole of power as was the case historically, i.e. the west, but rather the poles of digital and non-digital, dominated extensively by the US and China (Couldry and Mejias 2019:337). Scholars speak of the “decentring of global capitalism” (Seidl and Schmitz 2024:2151).

Looking at “the European way of Data”, it is clearly stated in the European Data Strategy that a goal is to promote “the European model around the world”. The EU aims to support Africa in establishing its data economy for the benefit of its citizens and businesses (European Commission 2020b:24). It is important to critically reflect that the development of an African data economy should be driven by African stakeholders and without dependencies. Moreover, it is questionable whether the EU is even capable of providing adequate support – other stakeholders, particularly China, already have a strong cooperative position with African countries regarding infrastructure and digital transformation. (cf. chapter 2.2.1.)

1.1 Background, Approach and Assumptions

Considering the global power dynamics outlined by Couldry and Mejias (2019:337), the ambitions to counter market asymmetry by the EU seem to be almost unachievable. One of the leading data space organizations, the Gaia-X Association for data and cloud, was initiated as the European cloud answer to hyperscalers. This narrative lasted from 2019 to 2022; however, the initiative took a turn and included US and Asian hyperscalers into its activities and discussions. This resulted in there being heavy critiques of the failing of its mission as a European cloud alternative (Chavanne 2021; Fermigier and Franck 2020; Krempel 2020; n.a. 2019). The European commission invested EUR 1.2 billion for a so-called “Important project of Common European Interest (IPCEI) on Next-Generation Cloud Infrastructure and Services”, which is a key measure to reach the EU goals of the digital decade (European Commission 2023). Just shortly before, the “smart and secure middleware platform” (SIMPL) for Common European Data Spaces was initiated (European Commission 2024a). From a technological point of view this is interesting, because the approach was taken from the data exchange layer to middleware and further to cloud-edge-infrastructure (top-down).

Technological sovereignty, implying supreme authority and independence, was initially focused on promoting national industries and local innovation. Today, it signifies a country’s

ability to maintain a degree of autonomy or minimal structural dependence in key technologies, thereby avoiding unilateral dependencies on international partners (Crespi et al. 2021:349). It intersects with strategic autonomy, economic sovereignty, innovation sovereignty, regulatory sovereignty, and digital sovereignty. These terms have a significant overlap so that they cannot be completely demarcated. Digital sovereignty refers to a nation's control over its digital assets, networks, and data, underscoring the need for control over digital technologies and infrastructures. As a policy framework, technological sovereignty involves designing objectives and instruments to ensure autonomy in critical technologies, supported by targeted industrial policies, investments, and secure, competitive digital environments (Crespi et al. 2021:349, 353).

The EU took a 'geo-dirigiste' turn in its industrial policy and shifted from a historical focus on market-creation to an interventionist, market-directing approach in response to technological and geopolitical changes. The aim of this geo-dirigiste turn was to safeguard technological sovereignty by actively steering resources towards strategic sectors (Seidl and Schmitz 2024:2148–51). The European Commission has played a key role in uniting diverse actors behind these policies through the concept of technological sovereignty, resulting in strong differences from other regions (Seidl and Schmitz 2024:2151, 2168ff).

The key stakeholders of data spaces are primarily European, since the incentives arose in this geographical scope (European Commission 2020b), but the claim of these stakeholders is that the concept should and will be transferred to other regions of the world (as already indicated in the European Data Strategy), because the modern, connected economy, and its value chains are globalized and digitized. Catena-X – the first open and interoperable data ecosystem and the first Data Space for the Automotive industry – is linked with an emphasis to solve industry problems on a global scale. It should be, however, critically reflected how participation in such a global approach to data space projects would need to be designed to be inclusive and fair. Otherwise, such endeavors could solidify the beneficial positions of digital hegemony or better positioned stakeholders and limit the benefits for companies and individuals in the global south. Strategic partnerships on digital transformation between any region and Africa should be critically questioned (e.g. Pan-African Programme; European Commission 2020; Pisonera-Hernandez 2020), as new mechanisms of exploitation will manifest in data capitalism. Therefore, new forms of resistance against exploitation need to be developed. Potentially, Afro-centric data spaces operated by African stakeholders, based on local sovereign infrastructure, could be an important measure to mitigate disadvantages in power relations and economic

participation in the context of the dynamics around data colonialism (Cieslik and Margocsy 2022; Couldry and Mejias 2019).

While the ambition to scale and transfer data spaces globally looks promising at first glance, it is, however, essential to consider the broader implications on innovation ecosystems worldwide. The Global Innovation Index (GII) provides valuable insights into how different regions are positioned in this global landscape, highlighting disparities that could influence the effectiveness and fairness of global data initiatives. The GII evaluates infrastructure, human capital, market sophistication, business sophistication, and knowledge and technology outputs and reflects the close tie between technology and economy, which is further related to political and societal fields. The GII involves consideration of four key stages of innovation: (1) science and innovation investment; (2) technological progress; (3) technology adoption; (4) the socio-economic impact of innovation (Dutta et al. 2023:27).

Technology-driven, high-income countries are the forerunners of the relevant global rankings, the first African countries in the list are Mauritius (57) and South Africa (59), whereas low income countries are at the very bottom of the ranking (Dutta et al. 2023). In the currently slow global economic recovery from the pandemic, high interest rates, and geopolitical conflicts, technology is developing fast but the socio-economic impact is reaching a slump for the second year in a row (Dutta et al. 2023:21). Labor productivity improvements have even reached a standstill, carbon dioxide emissions have risen strongly over the past three years and continue to increase – if this development continues, it can be expected that there will be no global CO₂ reduction in the near future (Dutta et al. 2023:21ff; see Figure 1). These findings appear to contradict the narratives of development organizations, which portray digitalization as a prerequisite for sustainable development, a concept called Twin Transition (see page 29) (Bianchini, Damioli, and Ghisetti 2023; Blüm 2022; Tänzler, Ivleva, and Bernstein 2022). In the research for this thesis consideration was made that such stated claims as resource efficiency, economic enablement, and empowerment of individuals might be a reflection of technology determinism, and that ECOWAS countries have different and specific local conditions – among many others, being affected by the Digital Divide.

Assumptions

After some initial research on the topic, it was assumed that dependencies on global hegemonies could be a hindering factor for emancipatory technology development in West Africa. Structures resembling colonial patterns, like asymmetric power relations, extraction and

exploitation of resources (like data and rare metals necessary for technological products), dependencies (on big digital players), and resulting limited capabilities in the global market seem to be manifest in the current global capitalist dynamics. The local contexts in West Africa are key to discussions about the emancipatory potentials of data spaces for the ECOWAS region, as it was desired to avoid Eurocentric perspectives on this matter. Therefore, abstractions were made, without ignoring the respective national and regional particularities of the 15 ECOWAS member states. This required an interplay of local and global considerations to avoid isolating the research process.

Another assumption made was that foreign nation-states and companies have a quite strong interest in digital investments in West Africa, perceiving it as a new market to be tapped. In the context of this research, it was desired to find out, which stakeholders are active in such endeavors and what are the historical contexts behind that.

Realizing data space in Africa could have hurdles like solid infrastructure, affordable internet access, available technology, and other criteria of the digital divide (African Union 2020:10; Calderon and Cantu 2021), thereby restricting African stakeholders to harvest specific values from digitalization and data. Increasing the participation of African stakeholders in the data economy could be crucial for the opposition to data colonialism (Cieslik and Margocsy 2022:353).

Currently around 100 data space projects are active, not a single endeavor is currently being realized in West Africa or in any other African country. Non-European activities are mainly located in Japan, China, and the US with affiliation to European associations or projects. These indications were the inspiration for the author to undertake the case study reported in this thesis.

The primary research questions of the work for this thesis are: *Which geopolitical and economic factors led to the phenomenon of data colonialism and how could Data Spaces be a counter-measure to it?* The relevance of this case is constituted by the fact that power relations are tied to the key resources and their exploitation – in the modern global economy this resource is data – and that the concept of data spaces has so far excluded participation of African stakeholders. Additionally, the digital divide puts a specific urge on exploring potentials of data-driven innovations in the global south to potentially resist further disadvantages in global power relations (Cieslik and Margocsy 2022).

Behind the guiding scientific lens for the work of this thesis (CIPE), a specific focus was put on the historically evolved structural disadvantages for African stakeholders to participate in data capitalism and which self-determined measures could be taken by African stakeholders to reduce the gap of participation in the data-driven economy. Potential major factors to elaborate for this research goal were the following:

- Historical context of colonialism and data colonialism,
- Technological determinism for innovation,
- Power dynamics,
- Ownership and control,
- Economic inequality and development in the context of the digital world,
- Governmentality and regulation of data spaces,
- Operating models and business considerations for data spaces in the global south, and
- Socio-economic pain points to tackle with use cases based on data spaces.

Among that broad scope, focus was placed on the historical context, characteristics of technology development, existing and evolving power dynamics, ownership and control, and geopolitical factors. This focus was justified by the breadth of the topic and subtopics and the desire of this thesis to be a starting point for further research.

1.2 Research Problem and Objectives

Since data have a large effect on power relations and are prone to intensifying asymmetrical power relations in modern capitalism, business motives, technological feasibility, potential infrastructural restrictions, and geopolitical interests need to be intensively reflected when researching data spaces from a non-technical perspective (Alemneh and Hastings 2006b:6; Cieslik and Margocsy 2022:356; Cukier and Mayer-Schönberger 2013:6). This topic has the potential to be the subject of extensive research spanning several years due to its complexity and extensive context. To stay within the scope of the work for this master's thesis, the focus for the analysis was on the following key aspects:

- Understanding the historical backgrounds of data capitalism and data colonialism/extractivism, and
- Identifying emancipatory potentials, challenges and/or opportunities of data spaces for West African stakeholders.

For a proper examination of the ECOWAS region, the first step involves an iteration on the context of capital and accumulation in the global context (Sadowski 2019). Resources have always been a very critical factor in industrial capitalist development – as colonial powers have forcefully extracted resources for their economic benefit (Fischer, Jäger, and Schmidt 2016:9). Over the past decades, society has become a witness to exponentially rising digitalization, digitization, and datafication (Mayer-Schönberger and Ramge 2017a). Some authors see data as a new currency (Coleman 2019:424). As data gets a more central and crucial role in modern society, economy, and politics, old patterns seem to have been reestablished: as corporations and governments from the global north are exploiting existing masses of data and gain new data to penetrate African markets (Coleman 2019:424). Due to the digital divide the global south is struggling with available infrastructure, data-related legislations, and other factors to, on the one hand, harness the potential benefits of data usage and exchange, and on the other hand to protect citizens and the local economy from data colonialism (Cieslik and Margocsy 2022:357; Coleman 2019:423). The global south is at a crossroads of becoming a bare data provider without reaping the economic benefits of it – similarly to what has happened for natural resources (Fischer et al. 2016:13). Modern economic and digital hegemony – primarily from the US and China (Staiger 2022:25, 276ff) are in an ongoing science and technology race (Williams 2023), while Europe is trying to close its technology gap to secure its competitiveness on the global scale (Smit et al. 2022), while that gap related to Science, Technology and Innovation (STI) is widening globally (Stamm 2023:5). The ECOWAS member states, which constitute the focus region of this thesis, exhibit significant disparities in both the pace and extent of digital innovation (Opeke 2023).

1.3. Scope and Limitations

The geographical scope of this study included ECOWAS countries (Benin, Burkina Faso, Cabo Verde, Cote d'Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo). In the thematic scope of data-driven innovation, the focus was specifically on data sharing as a potential accelerator for participation in the global digital economy and data sovereignty as an important value to establish personal and national security. It was clarified which specific factors constitute a data space per definition and assessed which benefits data spaces could bring in practice as a societal enabler and nurturing ground for self-determined economic empowerment and reduction of data-colonial patterns. Outside of scope of the work were in depth legal analyses or political analyses of data policies and data governance rules from local bodies (e.g. ECOWAS, AU, national governments), or

legal one-on-one comparisons to other regions like the EU, the Americas or Asia. Relevant for the context, but out of direct scope of the work for thesis were other African regions or countries. A technological analysis was not performed as part of the work for this thesis on the components of data spaces or other data-driven technologies.

Limitations of this study were the large complexity of the topic and the constrained scope of a master's thesis, making it impossible to address the subject to a sufficient extent. However, such a holistic approach would not be a reasonable expectation in this context.

An additional limitation was the heterogeneity of West African countries, but as ECOWAS member states form a regional economic community (REC) and have common institutions, legal recommendations, treaties, and protocols, it was considered that this focus region was appropriate for the work of thesis.

Access to key stakeholders, data repositories, and relevant documentation were constrained by logistical barriers, limiting the ability of the author to gather comprehensive insights for this research. To mitigate this, local experts were approached, as it was important to primarily interview local experts on this topic to avoid applying Eurocentric perspectives to the realities.

2. Theoretical Context and Literature Review

Christian Fuchs, a Marxist analyst, and Vincent Mosco, Professor Emeritus of Sociology at Queen's University, have analyzed the impact of digital technologies on the current capitalist system and assessed the relevance of Marxist theory in the digital age. They claim that Marxist theories remain specifically relevant nowadays (Fuchs and Mosco 2015:96), even though the nature of work and labor, information flows, and other societal aspects have changed (Fuchs and Mosco 2015:22fff; 54ff).

People have always been forced to produce in order to survive, the whole societal economic process is built on making raw materials usable and then profiting from them (Jäger and Springler 2015a:70). Data is often referred to as the raw material of modern capitalism and is thus implicitly equated with material goods, which incentivizes the datafication of different fields. This is a capitalist process and exhibits various similar consistencies to previous capitalist forms (Mayer-Schönberger and Ramge 2017; Wagner 2021:2). It remains a parasite of economic logic, related to the exploitation of individuals by digital capitalists (Fuchs

2019:60; Zuboff 2019:8–12). The stage of digitalization our society currently lives in is a rational consequence of the historical development of capitalism, as the “logic of capitalist and bureaucratic administration has driven the development of computing” (Fuchs 2019:53). This logical sequence continues and leads to an ever-growing amount of data (big data).

Neoliberal capitalism commodifies human communication and behavior as well. This phenomenon is called datafication, accompanied by a digital dispossession of data (Zuboff 2019:100). We also live in times of digital commodities based on “human natural resources”. (Fuchs 2019:54; Zuboff 2019:98). This commodification is not limited to personal devices. Smart cities and communities are equipped with sensors, cameras, and other tools that can capture citizens’ behaviors in public places. Individuals are constantly in the role of data producers (Yüksekdağ 2024), which creates a new macro-economic setting. In this context the International Division of Digital Labor (IDDL) has suggested two different streams of societal implications: On the one hand, individuals from lower income countries get the chance to better their salaries; on the other hand, a societal gap rises in the respective country as well as in relation to colleagues from higher income countries grows (i.e. less job security, low wages, exploitation, etc.) (Fuchs 2019:54). As an adequate context for this discussion, it was considered how concepts such as class, surplus value, and profit can be seen in data capitalism with data as a central resource.

2.1 Critical International Political Economy (CIPE) in Data Capitalism

This chapter will feature a general theoretic introduction to CIPE, followed by a historical contextualization of data capitalism, data colonialism, and emancipatory potentials. To provide an adequate context, a discussion of the societal superstructure was first made and from this, conclusions were drawn about the mode of production in data capitalism. These were followed by a discussion of the productive forces and relations of production (class relations) (Jäger and Springler 2015a:70).

For this thesis, the dialectic between technology and society is particularly relevant. Technology has always influenced class formation and society as a whole (Splichal 2022:98). Technology has never just been used, but also misused for interests of powerful actors, e.g. for political control or propaganda, as well as commercial interests and profit making. The societal context is decisive for how technology develops and what it is used for (Splichal 2022:99). The underlying causes of the issues intended to be addressed with technology are often not

adequately considered, as most societal problems cannot be resolved by technology alone (as techno-solutionism would suggest, see chapter 2.1.1.). In some cases, technology might even intensify them or create completely new problems resulting from such a reduced solution approach (Splichal 2022:100).

Marx addresses the role of machinery – technology – in the first part of *Das Kapital* by making it clear that the development of machines does not have the role of making an individual's daily work easier – their primary role is to produce surplus value by increasing the share of a working day that the worker gives to the capitalist (Marx 2023a:423). Even an unrestricted implementation of the capitalist mode of production, which can lead to a dynamic development of the productive forces, does not automatically lead to an improvement in the living conditions of large sections of the population (Jäger and Springler 2015:83). In particular, in the context of hegemonic capitalist social and economic structures, this nurtures the digital divide and other north-south dichotomies. If technology is seen purely as a neutral tool to achieve a purpose, this excludes the historical element (Marx 2023a:424). Marx' analysis builds on Hegel's dialectic of existence (the immediate) and essence (the underlying), and he makes it clear that while machines and technologies could and should make individuals' lives easier (e.g. modern data-driven technologies increase our leisure time) (Bruslinskij et al. 2006:22) as soon as they are employed by capital they restrict it (Fuchs 2019:55). In this context, the quantification of behavior and activities is a renewed asset in the reinvestment cycle for primarily hegemonic actors (Fuchs 2019:60; Zuboff 2019:70). As in previous capitalist forms, the structural compulsion to accumulate is inherent (accumulation imperative) (Jäger and Springler 2015a:80), but in data capitalism this imperative takes on an even stronger dynamic as quantity is the new quality (Fuchs 2019:55).

CIPE is ascribed particular relevance in discussions about technology and big data capitalism, because it emphasizes the importance of social struggle for a better society (Fuchs 2019:57). CIPE therefore not only has the role of opposing what it considers to be problematic structures, but also of arguing for a more solidary and egalitarian society (Jäger and Springler 2015a:83).

2.1.1. Societal Superstructure

The superstructure, discourses, narratives, and institutions that support a system are to be explored (Jäger and Springler 2015a:72). In this chapter, an assessment is presented about which narratives and communications are dominant in data capitalism and which institutions

support them. In CIPE logic, it is important to consider the dialectics between economy and society, labor and communication, capital and power, labor and ideology, production and reproduction, etc. (Fuchs 2019:56ff). Fuchs starts his explanation on narratives, communication, and social production with the cultural theorist Reynold Williams (1977): *“Williams [...] argues, [...] humans produce sociality through the communication processes. Communication is the process of the social production and reproduction of sociality and society.”* This highlights the dual nature of societal systems, where economic processes are interdependent with communications, thus shaping social interactions and structures. Data capitalism influences and is influenced by diverse social dynamics – and therefore leaves room for change and emancipatory potentials. Slavko Splichal, professor for communications and public opinion at the university of Ljubljana, warns that there needs to be caution: The Internet, and all built-upon technologies, can have emancipatory potentials – e.g. public use of reason from Immanuel Kant, giving individuals the opportunity to express freely in the public sphere. Nonetheless, they also have parasitic properties for oppression. Communication technology (ICT) does not just have the essentialist role of a mere communication tool: It has been designed, developed and applied for various purposes, including misuse for business or political manipulation (Splichal 2022:101).

Data capitalism brings forth a variety of discourses, which diverge widely. Solutionism and techno-solutionism are prominent examples (Morozov 2014), especially when arguing about green growth opposing reduced production (Sætra 2023:2). In this narrative, complex problems are reduced to simple technological issues without considering the deeper social and cultural dimensions. This goes hand in hand with technological arrogance, implying technology can solve all problems, often neglecting alternative approaches. Moreover, this ignores various contexts and thus distorts the actual problems. Overall, it can be a societally detrimental discourse such that when problems that are approached with technological solutions, which are reduced in their complexity and context, they can have unintended negative consequences that exacerbate the original problems or create completely new ones. An example of this is the introduction of surveillance technology to reduce crime without addressing the underlying social and economic causes of crime. Another is the assumption that educational problems can be solved using computers and software without addressing the underlying issues of educational inequality and resource distribution. Ultimately, techno-solutionism tends to reinforce inequalities (Duberry 2023).

Another prominent strand of discourse – interrelated with the aforementioned – is that of surveillance capitalism (Zuboff 2019), which addresses the commercial exploitation of user data by large platform companies such as Google, Meta and Co. Human's permanent data production means that their behavior can be quantified, and a variety of analyses based on this data can not only record actual states, but also be used to extract hypotheses for future behavior. Surveillance has become a pervasive aspect of modern society, as well as analyzing and changing behavior and therefore also social norms (Lyon 2018b, 2018a) (cf. chapter 2.1.2 and 2.2.).

In terms of labor implications, the discourse surrounding the platform economy, and the associated gig economy is particularly dominant. The transformation to data-driven business models is changing working conditions (Srnicek 2017) and data capitalism is influencing the rights and freedoms of workers. While flexibilization through free services and remote work is promoted, exploitation of digital work is often the underlying motivator for companies to offer these benefits (Scholz 2016). Furthermore, it must be considered how the quantified behavior is unpaid digital work and therefore has an exploitive factor (Fuchs 2019:60).

The above discourses are logically intertwined with each other, as platform capitalism enables surveillance; platform giants (e.g. Apple, Facebook, Google, YouTube, etc.), which are the most valuable and successful companies, are the ones who use surveillance mechanisms for their business models (Zuboff 2019). Fuchs (2019:58) speaks here of an surveillance-industrial complex, where in modern capitalism people share a lot of information online and companies turn this information into products to generate surplus value. Meanwhile, government agencies aim to access this huge amount of data under the narrative of keeping society safe. This shows there has been a transition in which consumption (of contents or services) functions as production (of data to be productized). Therefore, in data capitalism, human labor and human life are abstracted and commodified (Couldry and Mejas 2019:343).

Profound changes are taking place in cultural practices and norms – from work, education or healthcare to everyday practices. Fuchs (Fuchs 2019:57) has addressed in light of this commodity fetishism, which obscures the exploitation and social relations behind data production. As Shoshana Zuboff puts it: technologies are weaved into our lives so strongly that they disappear from our awareness (Zuboff 2019:198). This means the norms of life, work and consumption are shaped by constant data generation and analysis. Therefore, while people's

entire lives are increasingly digitized, privacy is often unconsciously sacrificed (Coleman 2019:427, 434; Salte 2023:169).

Consumer culture is taking on new dimensions, with consumer behavior being guided by personalized recommendations based on the analysis of rapidly developing algorithms and e-commerce platforms. Online shopping is becoming the dominant form of consumption, providing essential benefits to platforms like Amazon, which use extensive data analysis to optimize the shopping experience and deliver at the fastest speed possible. The early actors – like Amazon as the first online bookstore, but also Google as the ‘first surveillance capitalist’ – gained structural advantages in market share which has intensified their power (Manjikian 2017:32; Zuboff 2019:63). Users exchange with these companies their personal data for “free” services that are actually financed by monetizing those data assets. By shifting to subscription-based or completely free business models, companies are securing the inflow of continuous data streams which enable high profit margins (Bonenfant, Dumont, and Iseut Lafrance St-Martin 2023:24; Fuchs 2019:62). In this context, Fuchs (2019:57) has highlighted the effect of advertising fetishism, masking the exploitative data practices and manipulative techniques underlying targeted marketing. This leads consumers to focus on the perceived value of advertised products, while remaining unaware of how their personal data is being commodified and used to influence their behavior (Arnesson and Carlsson 2023:82; Rentmeester 2023:190ff; Zuboff 2019:8ff). These new services are often perceived as both an opportunity and a challenge, however, a critical examination of the history of data and its long-term effects on society and individuals is often lacking (Cieslik and Margocsy 2022:355).

Similar tendencies to the above are seen in new forms of work and significantly changing traditional working models, e.g. through remote work or AI and automation replacing human labor. In the data economy, power relations and the concentration of ownership are changing in the digital sphere, bringing forth an increasing acceptance of surveillance (Samuelsson et al. 2023:100, 125–40). Companies are using digital tools to monitor and analyze employee productivity, including the use of tracking software and performance measurement (Zuboff 2019:64). There are minimal legal protections for workers against surveillance (Sprague 2023:794ff), even though the right to protect private and family life is a human right (at least according to article 8 of the European Convention on Human Rights) (Sprague 2023:805).

In social institutions, like the educational system, digital technologies are an integral part of everyday life, and have strong ideological impacts on society (Stocchetti 2014:20–24). In the healthcare system, digital assistants and datafication promote techno-solutionist tendencies, while the associated ethical and social implications cannot be estimated yet (Ruckenstein and Dow Schüll 2017:262).

But “[j]ust because data, and the technology behind it, can help to reduce inequality, improve health and education, and spur economic growth does not mean it meets the criteria for privacy, security/safety, autonomy, justice, control, and power” (Kvalvik, Sánchez-Gordón, and Colomo-Palacios 2023). Data protection, data privacy, data security, and data sovereignty have become central concepts of global discourses. Regionally compared, there are very different approaches to these concepts. The EU sees itself as a data security pioneer and describes data sovereignty as a European value. The General Data Protection Regulation (GDPR) was a starting point for implementing these values, accompanied by the Data Governance Act, the Data Act, the AI Act, and others (European Commission 2022b). While the EU prioritizes individual privacy and data protection as fundamental rights and tries to ensure high standards of data security and data sovereignty via an extensive regulatory framework to promote transparency and trust in the digital economy, the US has adopted a sector-specific approach to data protection, with the two key pillars consumer protection and business flexibility. State-level laws like the California Consumer Privacy Act (CCPA) reflect growing attention to consumer privacy. Nevertheless, no comprehensive federal privacy law exists, which results in a fragmented regulatory landscape. In contrast to both these approaches, China pursues a centralized, state-controlled approach emphasizing data localization and national security. The government’s regulatory framework emphasizes a strong focus on (national) data sovereignty. In other parts of the world, different models have evolved. While Australia for example tries to balance privacy with law enforcement access, India is evolving towards comprehensive regulation with an emphasis on data localization, and in South America many countries have enacted comprehensive data protection laws, with Brazil’s Lei Geral de Proteção de Dados (LGPD, General Data Protection Law) being a significant milestone (DLA Piper 2024).

The Malabo Convention was milestone for regional data protection standards in Africa, but country-specific adoption and implementation are inconsistent. While Senegal has a robust framework, Gambia, Sierra Leone, and Guinea-Bissau do not have national data protection legislations in place (African Union 2014; ALT Advisory 2024a). The African Union has

published different data strategies and policy frameworks. For example, the Data Policy Framework was developed to leverage the potential of a robust digital economy in Africa and aims to create new business opportunities, increase efficiency, and contribute to sustainable development. In the strategy data is clearly acknowledged as a strategic asset and a key element of a contemporary economy and society. The need is also emphasized for data governance to create value and prevent harm and provides an overview of international and regional policy and legislation trends. It includes guiding principles, data definitions and categorizations, as well as an implementation framework. The Digital Transformation Strategy (DTS) for Africa 2020-2030 and the operationalization of the African Continental Free Trade Area (AfCFTA) are also seen as having significant potential (African Union 2022).

In the DTS it is suggested to leverage digital technologies for innovative, inclusive, and sustainable growth, thereby contributing to the AU's Agenda 2063 and the Sustainable Development Goals (SDGs). The vision is to create an integrated and inclusive digital society and economy in Africa that enhances the quality of life, strengthens economic sectors, and ensures Africa's participation as a producer in the global economy. Utilizing digital technologies to transform African societies and economies, promote integration, stimulate job creation, reduce the digital divide, and foster inclusive growth are the overall main objectives (African Union 2020). Key Components of DTS are digital infrastructure (access to high-speed internet and digital services), policies and regulations (to support digital transformation), digital skills and human capacity (and related investments), digital innovation and entrepreneurship (to drive economic growth and job creation), digital industry and trade (promote digital industries and e-commerce to facilitate intra-African trade), digital governance (enabling solutions to increase efficiency, transparency, and accountability), digital education (using digital technologies to improve access and quality), digital health (access to healthcare services), and digital agriculture (to modernize agriculture, increase productivity, and ensure food security) (African Union 2020:5–36).

2.1.2. Mode of production, productive forces, relations of production

In this chapter, Johannes Jäger's comprehensive diagram is followed on capitalist logic top-down and the mode of production is considered, which is at the center of CIPE, as well as the productive forces and relations of production, which together influence and change the mode of production (Jäger and Springler 2015b:71).

Mode of Production

The mode of production is characterized by the utilization of raw materials through work, which creates *use value* (Jäger and Springler 2015a:70). The use value is constituted by the usefulness of the raw material refined by work and is considered from a dual perspective (quality and quantity). However, the value of a product is not determined by how much effort is required to make it. Instead, its value is only realized when it is consumed by users. Use values represent the actual substance of capitalist wealth, which has an inherent worth that translates into exchange value. Raw materials do not have inherent exchange value, for these it is socially constructed. Exchange values compare use values in an abstract way and therefore abstract the labor involved (Marx 2023a:3–7).

To generate use value, human and technical organization are required, which results in a global division of labor (Jäger and Springler 2015a:71). This division of labor forms the basis of all commodity production. Production is divided into different domains (e.g. automotive or agriculture), but there is also a division within these domains and within companies. However, the division within a company is related to the concentration of the means of production with one or a few capitalists and the social division of labor is related to a fragmentation of the means of production. This division creates a wide variety of product groups and leads to an exchange of products between different and independent spheres of production. The density of society forms its material foundation. Density should be understood as a relative concept, heavily influenced by the available technical means, particularly communication technologies (Marx 2023a:399–406). This is not just about how many people live in a certain area but also depends on the tools and technology they use to communicate and connect with each other. These tools (like the internet, phones, or transportation) form the physical and practical foundation of how that society functions.

Workers sell their labor power as a commodity on the market, thereby they represent their labor as a use value. This labor is then used to transform raw materials, which have already gone through previous labor processes, into new means of production. These means define the structures of economic forms of society – the decisive factor is not *what* is done, but *how* (Marx 2023a:177–81).

Christian Fuchs has critically examined the exploitation inherent in digital labor through a Marxist lens in his book “Digital Labour and Karl Marx” (Fuchs 2014). He has argued that the global value chains of ICT – which is attached to the value chain of each domain in data capitalism – involves complex, dispersed labor processes that are often invisible to users. These span from mineral extraction to the final assembly and software development:

“The main information that the ICT user has about his/her device is from which retailer and company s/he bought it. But these companies are only those actors that sell these devices and own the profits made from these sales. The production process itself consists of multiple forms of labour that are invisible to the user. Yet without this labour ICTs would not exist because they are objectifications of complex human labour processes. A computer or mobile phone consists of application programmes, an operating system, cables, a physical case, a display, a battery, a central processing unit, random-access memory (RAM) data storage chips, read-only memory data storage chips, internal storage devices (hard disk, flashcard), a keyboard or other input device and a cooler. All of these components need to be created in complex labour processes and then put together as a computing system that is sold to the end user.”
(Fuchs 2014:156)

In data capitalism, there is a transition from old (industrial) forms of production to new ones, based on data and invisible digital work. Digital labor, whether in production or user-generated content on platforms like Facebook or Google, reinforces capitalist exploitation and requires a new understanding of class relations and labor dynamics in the digital age. Fuchs has claimed that modern digital capitalism has reached new levels of exploitation, especially in countries of the global south, with resourceful environments and societies (Fuchs 2014:163, 171, 180). Digital media is a spur to these exploitative dynamics, because it obscures the underlying labor relations. The fetishism of the internet portrays digital media as inherently progressive while masking the realities of global labor exploitation (Fuchs 2014:182–282). However, the international division of labor is undergoing totally different transitions; manufacturing is being placed in emerging peripheries while central countries are now focusing on profitable stages of production, leading to value transfers from poorer to richer regions (Ricci 2022:1324).

Capitalists rely on the exploitation of workers' labor to produce goods that are sold in markets. These goods include unpaid surplus value, which is turned into profit – the coercion to sell labor is added by a voluntary act of unpaid digital work, as users provide their data via digital platforms (Fuchs 2014:34,91). Individuals perform these various forms of labor (social media use, online browsing, and other digital interactions that produce valuable data for companies) mostly without compensation. This data extractivism enables the accumulation of digital assets (Fuchs 2014:100ff). Such an accumulation creates relations of dependency, which expand through the number of its subjects – thereby expanding its own dimension of surplus. The capitalist purpose is the utilization of capital and the production of commodities that contain use value. Production and surplus value form the absolute law of the capitalist mode of production (Marx 2023a:738–41). However, accumulation goes beyond the quantitative increase of capital and also involves a qualitative change in its composition. Capitalist accumulation thus changes the relation between constant capital (the means of labor in the hands of the capitalist) and variable capital (the value of labor power in the production process) (Marx 2023a:757ff).

Capitalists must continually innovate to outcompete others, leading to technological advancements that replace workers, reduce wages, and increase profits – for which data and technological infrastructure play a crucial role (McCarthy 2017:64). Data has many ascribed aspects and definitions: Data as raw material, data as resource, data as the new currency, data as a commodity, data as common good, data as unalienable right, etc (Cieslik and Margocsy 2022:365ff; Coleman 2019:424; Couldry and Mejias 2019:340). Collecting data is easy and inexpensive, and nowadays vast amounts of data can flow quickly and cheaply between transaction partners. These capabilities have even led to a data overload for powerful market participants, which in turn requires appropriate methods and tools to process (Mayer-Schönberger and Ramge 2017b:77ff). Just as the forms of capitalism of past centuries were dependent on *cheap nature* – i.e. raw materials in abundance – so is the case for data capitalism with its dependence on *cheap data*. However, this reveals a misconception of data as a natural raw material; every asset that exists in terms of data is not *simply there*, it must first be captured and collected. This narrative is therefore a false naturalization of data. And just as natural resources were *not cheap per se*, and were only rationalized as such, neither is data. This logic turns data and its use by capitalist actors into the *no man's land* of this stage of capitalism (Couldry and Mejias 2019:339ff). Only the contextualization of data and further productization ascribe value, even though data might have material aspects. The use value of data arises from

its information content e.g. for gaining knowledge for decision-making processes, personalizing offers, increasing efficiency through automation, and promoting competitive advantages. This usefulness depends on the type and quality of the data and its relevance to specific needs. Well-structured, qualitative data enables analyses, forecasts and optimizations in various areas (Mayer-Schönberger and Ramge 2017b:81–86). In terms of monetary value, data has two major streams: the monetization of the data per se (selling raw data), or monetizing the services based on data (selling data products or services, like analytics or applications) (Coleman 2019:424, 437; Zuboff 2019). As data is concentrated in the hands of a few tech giants, this exacerbates economic inequality and limits competition also in the monetary sense. This dominance allows these companies to exert significant control over market dynamics and consumer behavior (via behavioral surplus at scale) (Zuboff 2019:82ff, 97). This power imbalance is reflected in different effects, which include unequal data sovereignty (individuals and nations lose control over their data to multinational corporations), market manipulation (through targeted advertising and pricing strategies), surveillance (infringing on privacy and civil liberties), economic inequality (concentrated capital and resources) to name just a few examples. This has strong implications on the productive forces.

Productive Forces

Together with the relations of production, the productive forces form the basis for the mode of production, influence its historical change, and continue to develop. They are based on earlier social transformation processes. As a result, society now has completely new means of production at its disposal (Jäger and Springler 2015a:71). Over the past decades, there have been ever greater increases in productivity, fueled by technology (Jäger and Springler 2015a:76).

The productive forces are the major driver for surplus value. Marx has distinguished between two options of gaining surplus value: lengthening the working day (absolute surplus value) and shortening the working day by increasing productive forces (relative surplus value). This increase in productive forces leads to changes in the labor process, where the quantity of labor decreases while the quantity of use value increases. Thus, to increase productivity, the way things are produced must be changed, and therefore also the tools and resources used in production. Marx has given the example of a boot, where the value of the leather, wire, pitch, etc., just like the shoemaker's work contribute to the value of a boot as a commodity (Marx 2023a:353ff). Applied to a data product, the raw data (web traffic or sales data), data preparation

(cleansing, aggregation, etc.), and the algorithms and models (machine learning or clustering) could be the leather, wire, and pitch, while the work of data scientists and data engineers (model development, training, and evaluation or implementation and maintenance of the data infrastructure) or free digital labor (data provision itself by users) are like the shoemaker's work. All these components are necessary to create the end-product and thus contribute to the overall value. While the value of goods is inversely proportional to the productive forces of labor, the relative surplus value increases with rising productive power. Moreover, it is the intrinsic drive of capital to increase the productivity of labor in order to make goods cheaper and thereby reduce the costs for workers (Marx 2023a:359). Due to the inherent coercive law of competition in capitalism, the driving motive for individual capitalists is to continually increase the productive forces. In capitalist logic, this remains an endless cycle of increasing productive forces to increase the relative surplus value for the capitalist (Fuchs 2019:358). However, productive forces in capitalism are not only determined by commodity value and labor value (Marx 2023a:13–15). The division of labor has the purpose of increasing relative surplus value along entire value chains, because specialized work increases efficiency, which also increases the productive forces (Marx 2023a:282–87). As a result of the industrial revolution and the use of ever newer technologies, the speed of the development of productive forces continues to increase. Machinery and technologies are making human labor obsolete, at least for standard tasks (Marx 2023a:444–52).

According to Marxist theory, the productive forces comprise the means and methods used to produce goods and services, encompassing technological, material, and human resources. Productive forces in data capitalism therefore include technological infrastructure, hardware, software, raw materials, human labor, education, knowledge, and skills (general social knowledge has become a direct force of production which means knowledge, communication and technology thereby have become common goods). These productive forces enable the generation, processing and use of data, which form the basis for new economic and political exploitation in data capitalism (Fuchs 2014:102, 157, 2019:50, 53). In the sense of productive forces, data capitalism has sublated industrial capitalism (Fuchs 2014:170).

Based on the aforementioned considerations, table 1 contains an overview of productive forces in data capitalism.

Table 1: Productive forces in data capitalism (own composition).

Example	Productive force	Category	Context
Data centers	Infrastructure	Technological	Physical facilities acting as central hubs for storing and processing large volumes of data (e.g. servers, storage devices, network components)
ICT	Infrastructure	Technological	Enables global flow of data (e.g. Fiber optic cables, satellites, mobile networks, internet)
Computers and servers	Hardware and devices	Technological	machines that perform calculations, process and store data
Mobile devices	Hardware and devices	Technological	Make access to digital services easier and continuously generate data (e.g. Smartphones, Tablets)
Sensors and	Hardware and devices	Technological	collect data from the physical

			world (e.g. smart refrigerator)
Analytics tools	Software and algorithms	Technological	including data mining software or machine learning
AI	Software and algorithms	Technological	Algorithms and that can recognize patterns and make predictions
Platforms or apps	Software and algorithms	Technological	interfaces between users and services or apps that collect and process data for commercial or political (mis)use
Energy	Resource	Physical	power required to store, process, and transmit digital information
Semiconductors, rare earths, metals, minerals, etc.	Raw materials	Physical	Material base for all the above mentioned, heavily associated with human exploitation
Data as a raw material	Raw materials	Physical	generated by human activities and by machines; key resource and

			productive force in data capitalism, basis for modern business models
Unpaid data generation	Human labour	Physical & societal	Individuals who generate via digital devices and platforms; often not considered a workforce
Unpaid (digital) work	Human labour	Physical & societal	Gig economy workers generate data and perform work that is managed by algorithms
Skilled employees	Human labour	Physical & societal	Programmers, data scientists, engineers and other specialists who develop, operate and optimize data technologies
Digital libraries	Education, knowledge & skills	Technological & societal	Provide vast repositories of resources; diverse assets accessible to a global audience (who has internet access)

Digital contents	Education, knowledge & skills	Technological & societal	educational materials such as e-books, videos, interactive simulations that can be distributed and accessed online
Online courses	Education, knowledge & skills	Technological & societal	often offered through learning management systems (LMS) or dedicated platforms, provide scalable and accessible educational experiences
Educational apps	Education, knowledge & skills	Technological & societal	leverage mobile technology to deliver interactive and engaging learning experiences

Conclusively, the material basis of data capitalism can be understood as extremely diverse and complex. The economic and material conditions of the foundation for the societal and ideological superstructures (the materialistic aspects of data capitalism) therefore go far beyond raw materials, resources, and energy. In recent years technology changes have become more radical, leading to broader societal shifts. The materialism of technology is essential to its consequences on the environment, society, economy or political system (Sætra 2023:14ff). An analysis of the implications of technology can be broken down into three levels: micro (individuals), meso (groups), and macro (societal or global). Each level reveals different

impacts, such as individual benefits potentially leading to group inequalities and broader economic and societal changes on a larger scale (Sætra 2023:16).

Twin Transition as Driver for Productive Forces

The twin transition is propagated in order to drive the evolution of productive forces in data capitalism by increasing efficiency and sustainability. Digital advancements optimize data use, while green technologies promote eco-friendly production methods. Sjoerd Blüm has outlined in the context of the World Economic Forum 2022 a strategic approach to achieving sustainable digitization. He has suggested a three-phase approach: Assess, Act, and Accelerate. In the Assess-phase, organizations should evaluate their current state and identify opportunities for digital and sustainable transformation. The Act-phase involves implementing these opportunities with a focus on quick wins and scaling successful initiatives. Finally, the Accelerate-phase emphasizes continuous improvement, leveraging data, and scaling best practices to drive long-term sustainability and digital transformation (Blüm 2022).

The concept of the twin transition arose mainly within the contexts of the EU Green Deal and the goal of climate neutrality by 2050 and has gained global resonance, thereby reflecting universal efforts to advance both fronts of sustainability and digitalization. Practical implementation involves a strong focus on the circular economy within manufacturing, with significant overlaps in topics like sustainable development, supply chains, and smart manufacturing (Müller, Lang, and Stöber 2024:4ff, 9). This twin transition agenda, which has both internal and geopolitical dimensions, extends to the African continent as well. The key findings of a report on the cooperation between the EU and North Africa on the twin transition suggest that while this initiative presents opportunities for cooperation, it is hindered by conflicting priorities and Africa's predominant focus on security (Santaniello, El-Shal, and Bouckaert 2022:3, 31).

In the context of the twin transition the SDGs have strong interconnections with technology as accelerator or hinderance factors (Sætra 2023:19). Networked digital productive forces have been propagated to be the solution for socio-economic and ecological issues: nature could be saved, while doing capitalist business as usual – but faster. Ulrich Brand has written critically on this in the broader context of the green economy as a form of ecological modernization (Brand 2016:108ff). He has clearly pointed out the major constraints of a functioning green economy, where one major constraint is the *imperial mode of living*, which emphasizes

continuous and largely unchallenged access to products made by cheap labor under environmentally problematic conditions (Brand 2016:114ff). Modern technology like ICT or data technologies and consumer devices are very resource intensive and lead to tragic working conditions for workers at the very bottom of the supply chain – e.g. mining the materials (iron, copper, aluminum, etc.). Fuchs has called this modern slavery and criticized its hidden implications: *“The ICT industry is a bloody industry, and its murderous and exploitative character is hidden behind the fetishism of commodities; for instance, a thing like a computer or a hard disk is the outcome of labour relations, but these relations cannot be observed and experienced by looking at the product; they are hidden behind the final product”* (Fuchs 2014:173).

The dichotomy between the discourses and debates of technology for ecological and socio-economic consequences is therefore very divergent. At this point, skepticism should be placed on the narrative of a successful twin transition, which could be ecologically sustainable, socio-economically equalizing or redistributive and economically beneficial at the same time. Based on Fuchs this skepticism has different assumptions: Current political institutions focus on global competitiveness and geopolitical interests, powerful international bodies advocate free trade and the capitalist market’s profit-driven technological development, societal orientations prioritize growth at any cost while exploiting the planet, and power dynamics are dominated by elites striving to maintain their status (Brand 2016:112). Even if technology has potential for social emancipation within a highly technologized world, it is a product of socio-material practices not an autonomous force. Ignoring this fact leads to *militant optimism* that remains committed to the unfulfilled promises of technology for social good (Frey, Schaupp, and Wenten 2021:21).

The EU is building strong ties in the context of the twin transition with Africa. This is also reflected in the *EU-Africa Global Gateway Investment Package* where 150 billion Euros has been mobilized for a collaborative twin transition between Africa and the EU (European Commission 2022a). With its flagship project *Medusa*, officially announced in November 2022, the EU aims to enhance digital connectivity between the European Union and Africa. This initiative involves the installation of a high-capacity, 7,100 km long optical-fiber submarine cable, connecting Mediterranean EU countries with African countries. This project is part of the EU’s Economic and Investment Plan for the Southern Neighbourhood and the Global Gateway strategy, targeting improvements in digital infrastructure to foster socio-economic

growth, innovation, and research across the regions involved. The European Investment Bank (EIB) has committed significant funding to support this transformative digital connectivity effort, with the project expected to be operational between 2025 and early 2026. Politically, the Medusa flagship project reflects the EU's strategic shift towards investment in critical infrastructure to foster sustainable development and counterbalance China's Belt and Road Initiative (European Investment Bank 2023; Komminoth 2022). The first touchpoints are East and North African countries, but with the inclusion of Senegal this project will enlarge to West Africa (European Commission 2022a; Komminoth 2022). Initiatives like the Global Gateway plan indicate a strategic move to assert influence and control over key economic sectors, including digital infrastructure.

Relations of production

As indicated above productive forces and relations of production build the basis for the mode of production. Data capitalism sublated industrial capitalism in the sense of productive forces, but not class relations (Fuchs 2014:170). Although the class category is fundamentally overstrained, it is important within the framework of CIPE to consider the corresponding tendencies that go hand in hand with the power relations of the respective capitalist epoch in order to be able to derive possible emancipatory approaches from them (Jäger and Springler 2015a:75).

Marx has divided groups of property owners into two main groups in order to explain class and dependency relations: One group owns property based on their own labor, while the other group is dependent on the exploitation of the labor of others. In Marx's time, all national production in Europe was already subject to the capitalist system, whereas this was not yet the case in the colonies. In order to have enough wage laborers, the economic structures in the colonies had to be changed through *systematic colonization* (Marx 2023a:928ff). Means of production as property of the immediate producer are not capital, they only become capital through their transformation into a means of exploitation and control of the worker. While people in Western Europe had already expropriated themselves for the accumulation of capital, the class size of wage laborers in the colonies was not sufficient (Marx 2023a:930ff). The dispossession of the broad population from their land was essential to the capitalist mode of production. In Marx's time, the separation of agriculture from industry in the colonies had not yet eliminated rural farming industries. The necessary relationship of dependence, in which a working class performs cheap and obedient labor under conditions dictated by capitalists, had to be created

by artificial means (Marx 2023a:932–35). As Rosa Luxemburg argued, capitalism often resorted to violent methods against non-capitalist social formations to appropriate means of production and labor. This included the systematic destruction of indigenous social structures in colonial territories (Luxemburg 1975:318).

Today, economic and social systems have become globalized and class relations are changing in accordance with a global working class dominated by a few economic hegemons. This is a multiverse of exploitation and a dichotomy between the rich and the rest, (Fuchs 2014:305, 313), whereby economic classes are more evident in peripheral countries (Jäger and Springler 2015a:74). The current change in social forms of organization and production is anchored in the changes in productive forces and shows exponentially increasing concentration of power and monopolization (Jäger and Springler 2015a:71). In data capitalism, the concentration of power in large technology companies creates new class relations in which a small elite of data capitalists exercise control over the means of production while most people serve these interests (consciously and unconsciously). Thus, overall economic and societal structures are widely disrupted. Data is viewed as a new form of capital, with tech companies acting as the new bourgeoisie, extracting surplus value from the data produced by a global proletariat (the users and consumers, gig-workers, miners and others in the global value chains of ICT-based technologies), leading to a more pronounced concentration of income and wealth (Ricci 2022:1324–26).

The process of capital accumulation constantly requires new markets and resources. This expansion leads to constant conflict and destruction of the existing social order, which is a dynamic that is an ongoing process continuing to present day and beyond (Luxemburg 1975:325). In this context, the asymmetry of information is intensifying the new forms of exploitation and control (Fuchs 2019:58). This new ruling class does not only accumulate surplus value, but it also exploits information asymmetry. It provides access to specific information users require, sometimes for free. It helps users find the information they are searching for or allows them to build their social network. It facilitates specific financial transactions and provides geographic coordinates along with details about those locations. It might also supply logistical infrastructure for small business owners or other foundational economic support. While users receive this small piece of information, the ruling class collects all the data and aggregates it. They gather information which users “volunteer” to share

(Samuelsson et al. 2023:191). The work and value creation performed by individuals through their data generation appears to individuals as personal added value.

Data capitalism is based on complex relations of exploitation and domination that are deeply embedded in the structures of our society, *weaved into our lives* (Zuboff 2019:198). These relations promote the concentration of power and wealth among a few large players (Fuchs 2019:58). Thereby, capital becomes social power, giving individual capitalists control over social conditions, leading to a conflict between digital productive forces and class relations. Networked digital technologies bring new forms of commodification and exploitation, creating challenges for accumulation. Platform giants leverage their market power to eliminate or acquire competitors, resulting in increasing monopolization and the concentration of resources and knowledge (Fuchs 2019:56). This concentration of resources and therefore power relates not only to data, but also to infrastructure, which is why it is particularly important to consider the ownership and investment structures related to ICT and the built-upon technologies (see chapter 2.2.).

Strong class fractions – just as in previous forms of capitalism – exist in data capitalism (cf. Jäger and Springler 2015:74). There are certainly strong differences between an app developer or data analyst from Silicon Valley and a gig worker or cobalt miner in or from the global south – who all could be categorized as working class. Moreover, even if no one is formally excluded from the production process today because everyone produces and consumes data in some form, people still suffer from subsistence anxiety due to under- or unemployment. In the global South, this situation is exacerbated by the lack of welfare state protection (Jäger and Springler 2015a:75). CIPE involves an understanding of precisely this exclusion as a characteristic of capitalist economies (Jäger and Springler 2015a:76). Global inequalities that were present in historical colonialism are reflected in these current dynamics. Similar to commodities in classical colonialism, the countries of the global North and their corporations benefit far more from the data than countries and individuals from the global South (Couldry and Mejias 2019:337). Many countries and individuals have little control over how their data is used (data sovereignty), which leads to an asymmetry of power (Cieslik and Margocsy 2022:353).

Due to their economic power, technology companies also exert considerable influence on political processes and engage in intensive lobbying to shape or prevent regulations in their favor. In addition, the platform giants can use their global reach and market power to circumvent

regulations in various countries and take advantage of tax benefits. In most countries world-wide, sufficient data protection laws do not exist – and even if they do, there are loopholes, as the case of *Cambridge Analytica* showed very prominently. It is also common for the state to support technological development and thus the interests of large technology companies through subsidies, tax incentives or investments in digital infrastructure (Coleman 2019:435; Zuboff 2019:482–86).

Although datafication has led to recognizable changes within the basic pillars of capitalism, there are currently no changes to the capitalist system in general (Jäger and Springler 2015a:73ff). However, digital information also has aspects that resist commodification due to an ongoing conflict between digital commons and digital commodities – many data products also become public goods and therefore assets for a diverse spectrum of stakeholders. Digitalization enables the working class to organize themselves collaboratively (Fuchs 2019:56). The possibilities for social organization in terms of social movements and resistance should therefore not be underestimated. Moreover, such societal conflict is important for change (Jäger and Springler 2015a:75). By looking at examples from *Foxconn*, the Indian software industry, and the *Occupy movement*, Fuchs has shown that digital labor struggles can help create new working-class movements and fairer social media practices. He has concluded that it is important to critically understand digital labor and that resistance and new collective actions are needed to challenge the unfair structures of the digital economy (Fuchs 2014:182–96).

In Latin America, data activism movements are rising up, where these involve a range of collective actions and organized movements that use technical expertise and online platforms to challenge the dominant corporate and state control over data. The aim is to promote a more egalitarian approach to data management and access, focusing on transparency, accountability, and the protection of digital rights. This data activism includes various tactics and strategies to document social issues, enhance public awareness, and drive social change, particularly in the context of human rights violations, privacy breaches, and the commodification of personal data. This form of digital citizenship uses data to advocate for policy changes and to use forms of resistance to the pervasive surveillance and data extractivism practiced by corporations and governments (Segura and Waisbord 2019:413–18). However, this movement has structural limits: Internet access in Latin America is improving but coverage still varies strongly across the continent. People in different places and from different economic backgrounds do not have equal access. Digital companies often focus on most profitable areas, which makes these

differences even worse and leaves behind people who are already at a disadvantage. This reality might apply to West African countries as well (Segura and Waisbord 2019:416).

In a society centered on shared resources, digital work could transform from labor to cooperative efforts where information becomes a freely accessible common good rather than a commodity. This approach fosters a commons-based internet, where digital platforms are collectively controlled and operated, moving away from private ownership and capital accumulation. Fuchs has listed different examples of such initiatives, including non-commercial social networks like *Diaspora**, *Occupii*, and *N-I*, which prioritize community and collaboration. However, these platforms face significant challenges within the capitalist framework, relying on donations and volunteer contributions due to their non-profit business model. Their limited resources and smaller user bases put them at disadvantage compared to commercial giants, which benefit from substantial financial, operational, and user engagement resources. Overall, while these alternative platforms embody ideals of communal sharing and cooperation, they struggle against the economic and resource disparities inherent in the capitalist system (Fuchs 2014:301–3).

The ever-increasing digitization and datafication are seen as having no alternative and are creating an ever-widening cultural hegemony of technological advancements. Critical Internet scholars argue that conventional Internet Studies, focused on empirical methods, often legitimize and reproduce capitalist domination. This instrumental and technological rationality turns ideas into tools for maintaining control and suppressing alternative possibilities. The field of Critical Internet Studies challenges these norms by embedding analyses within broader social structures and advocating for a world free from exploitation and domination. There is a focus on how the Internet can empower or oppress, aiming to uncover and promote practices that liberate people from these forms of structural violence and power (Fuchs 2015:31ff).

Furthermore, socially initiated change would need its counterpart in political institutions, policies, and actions. Even if Karl Marx's work may not seem directly connected to technology in regard to global politics, his work offers a way to understand the politics of technology better. Marx shifted the focus from Hegel's abstract notions of 'Spirit' to more concrete political and economic activities of people. He argued that simply changing ideas was not enough for political change, as material conditions must also change (McCarthy 2017:63ff). However, governments and state institutions have their own interests in ever-increasing datafication. They

collect and use data for surveillance purposes, national security, and public services. These actors play a complex role, as they are both regulators and users of data. In addition, strong technological nations have significant advantages in access to data and in the development of technologies, leading to global power imbalances. This idea could be developed further up to the suggestion that modern society is a data-driven instrumental society governed by computation. Zuboff has portrayed such a *Big Other* as absolutely realistic in the short term, as the data for such superorganism would already be available. In such a new social fabric, a collective intelligence would serve the greater good based on *social universalities*. Such superintelligence could – according to its propagators – eliminate political shortcomings and replace them with predictive mathematical planning. In other words, representatives of this opinion expect better social systems via such superorganisms (Zuboff 2019:430–34). Even if this scenario still might seem far away or unrealistic for many at the moment, this potential development should be actively shaped towards societal good and not harm, so that emancipatory potentials would arise.

Conclusion to this Chapter

In the logic of historical materialism, the mode of production (constituted by relations of production and productive forces) and superstructure (social, political and ideological structures) influence each other. The interaction between these factors in data capitalism shows how legal, cultural and political structures influence the development of productive forces and relations of production and vice versa. Laws and political measures can shape the framework conditions for data use and processing, while the economic power and technological innovations of technology companies shape and change the social superstructure. This dynamic interaction determines the direction and form of data capitalism and creates a complex web of mutual dependencies and influences.

The ideological hegemony of data capitalism is characterized in the social superstructure by reinforced consumer norms that present digital services and products as necessary and desirable. This cultural acceptance constantly promotes the demand for digital products and services and supports the narrative of techno-solutionism. In addition, this cultural hegemony leads to ever-growing incentivization for unpaid digital work in the form of data generation, where this voluntarily provision of data is often unconscious, but even if consciously performed it might be perceived as personal advantage. This leads to ever-increasing resource creation for data capitalists.

The global south often lacks regulations, which often attracts foreign direct investment with negative consequences (Coleman 2019; Fuchs 2014:202). Data protection laws such as the GDPR can influence how data can be collected, stored and processed. Such regulations can significantly restrict the business models of technology companies by regulating their access to data and placing new requirements on data processing. However, this must also be enforced accordingly. In the end, this does not prevent companies from moving to other areas where they find more attractive data usage conditions. Thus the result for the regulator might just be a weakening their own local economy (Coleman 2019:439). Evgeny Morozov has used the term *Internet-centrism* to describe the tendency to view recent technological developments as inherently beneficial, often disregarding broader political contexts and potential downsides. He has critiqued the belief that technological solutions are universally applicable, emphasizing that this perspective frequently overlooks critical socio-political nuances, particularly in non-Western contexts. By highlighting these oversights, Morozov argued that Internet-centrism can lead to flawed political strategies and policies that fail to address the complexities of diverse political environments (Morozov 2014:17, 43, 119). Tim Wu's analysis of big corporates and anti-trust laws has underscored the need for modernized antitrust laws to address the unique challenges of data capitalism. The concentration of power in tech giants through data control mirrors past industrial monopolies and requires robust regulation. Antitrust laws should prevent anti-competitive practices like data hoarding and exclusionary tactics, ensuring open and competitive markets. Modern frameworks must include consideration of data as a critical resource and intersect with privacy regulations to protect consumers (Wu 2018).

In conclusion, political framework conditions can promote the development of data capitalism by governments investing in digital infrastructure and research (e.g. through subsidies, tax incentives and public research projects such as the Common European Data Spaces). As a result, regulations can easily become a secondary priority. This economic focus of political institutions can have a very negative impact on social well-being and neglect the political mandate of socially relevant regulations. Through lobbying, powerful tech players strongly influence legal regulations in order to create a favorable environment for their business models.

The ever-growing concentration of wealth and power in a few technology companies can exacerbate social inequality and tensions. Nevertheless, these tensions are an essential basis for possible societal and political change and can lead to movements for greater self-determination,

sovereignty, and redistribution. However, a fruitful interplay between society and politics is important for this, which could be reduced by economic pressure on political actors.

2.1.3. Productions sphere and circulation sphere in data capitalism

Value generated in the sphere of production is only realized when it is successfully sold in the sphere of circulation; however, these terms have no clear boundaries. In the sphere of circulation, it is decided how much surplus value is realized and who appropriates how much surplus value (Jäger and Springler 2015a:80ff). In the second book of *Das Kapital*, Karl Marx described the three circuits of capitalism: the circuit of money capital, the circuit of commodity capital, and the circuit of productive capital (Marx 2023b:3–88). While these circuits are interconnected and describe a unified process, their differentiation allows a deeper understanding to be obtained of how capital operates, how surplus value is created and realized, and how potential crises can emerge within this system.

The circuit of money capital describes the movement of money in the capitalist economic system, with the aim of increasing capital. This cycle is divided into three main phases: In the Money Phase (M-C), the capitalist starts with a specific amount of money (M) and uses it to buy means of production (raw materials, technology, etc.) and labor, referred to as commodities (C). In the Production Phase (P), the purchased means of production and labor produce new commodities (C') that have a higher value than the initially invested means of production and labor. In the Commodity Sales Phase (C'-M'), the newly produced commodities (C') are sold on the market, generating a larger sum of money (M') than was initially invested (M), thus realizing surplus value (profit). The entire circuit can be represented as $M \rightarrow C \rightarrow P \rightarrow C' \rightarrow M'$ (Marx 2023b:3–31). This circuit is focused on the initial investment and the return to the starting point with more money (M').

The circuit of productive capital is represented by the formula $P \rightarrow C' \rightarrow M' \rightarrow C \rightarrow P$. Here, P stands for the production process where means of production and labor are combined to create goods. C' represents the refined goods with added value, ready to be sold. M' is the money earned from selling these goods. C describes the new means of production and labor bought with this money to start the production process again (Marx 2023b:45ff). This circuit emphasizes the role of production in creating surplus value.

The circuit of commodity capital is represented by the formula $C' \rightarrow M' \rightarrow C \rightarrow P \rightarrow C'$. In this formula, C' stands for the finished goods that already contain surplus value. M' represents the money obtained from selling these goods. C represents the means of production and labor purchased with this money. P is the production process where these means of production and labor are used to create new goods. Finally, C' signifies the new, more valuable goods produced, which then re-enter the cycle (Marx 2023b:72–75). This phase highlights the realization of surplus value through the sale of commodities.

The distinction between these circuits underlines the fluidity of capitalist economies and their vulnerability to malfunctions and crises. In the money capital phase, issues like obtaining sufficient capital for investment or changes in interest rates can cause disruptions. In the productive capital phase, production issues such as supply chain problems or inefficiencies can hinder the realization of surplus value. In the commodity capital phase, market issues like overproduction, underconsumption, or competition can affect the realization of surplus value.

If there is an oversupply of any form of capital in one of these spheres, Marx has spoken of the idea of the *plethora*, particularly in relation to money capital that cannot be realized into value via profitable investment opportunities. In such situations, large amounts of capital accumulate in the hands of capitalists without being productively invested. Therefore, a distortion of circulation takes place, which is reinforced by credit systems and trading on capital markets. The result is that this *game* of speculation and manipulation of market prices replaces labor as the original method of acquiring capital and takes the place of direct violence for appropriation (Marx 2023c:261–64).

In the context of data capitalism, it could be interpreted that control and profit through the use of data is increasingly replacing traditional power and physical ownership. Instead of direct force or physical ownership, economic power and wealth is gained through the collection, analysis and monetization of data. Companies that own and can use large amounts of data dominate the market much like railroad barons in the 19th century did by controlling and profiting from information and technology (Marx 2023c:263).

Data capitalism also substantially affects the financial and capital markets. The integration of big data analytics and machine learning enables accurate financial forecasting, risk management, and fraud detection (Wasserbacher and Spindler 2022:71, 85). Real-time data

analysis supports the development of personalized financial products and services, based on the claim of improving customer satisfaction and engagement. However, the proliferation of data increases complexity in service management and intensifies market competition, requiring advanced data handling capabilities and professional expertise. The rapid development of data analytics leads to a more interconnected financial ecosystem, which allegedly promotes innovation and strategic growth in the industry. Thus, emphasizing the importance of data security and fair, effective knowledge management strategies (Morshadul, Hoque, and Le 2023:486–89; Pisoni, Molnár, and Tarcsi 2023:8–10). This underlines that capitalism is multidimensional, encompassing various forms such as financial, imperialistic, informational or hyper-industrial. These dimensions are interconnected, but vary in their level of importance (Fuchs 2014:100).

The circulation sphere enables the reproduction of capital, through which capitalist societies continuously maintain and renew economic and societal structures. This process includes both simple reproduction, in which the level of production remains constant, and extended reproduction, in which the level of production grows. Reproduction is directly interrelated with production, as it ensures and enables the ongoing production process. The reproduction of labor depends on the production of consumer goods that workers require, while the reproduction of capital takes place through the sale of goods to generate profits and finance investments. Data capitalism relies on the constant production of data through unpaid labor. This transforms society into a continuous production site, where personal data becomes a commodity. As outlined in the previous chapters, the therefore necessary unpaid labor spans various areas, including housework, care work, education, and others. In contemporary capitalism, people spend many daily hours creating value through unpaid labor. This means that life itself has become a form of a factory, with unpaid work extending beyond traditional wage labor (Fuchs 2014:107, 111).

As described in the chapter, the generation of value from data as a commodity is concentrated in a small number of players such as platform giants, search engine operators, e-commerce service providers, and data brokers. These data capitalists have to invest in ever better technologies in order not to succumb to their competitive struggle, which results in a pressure of competition to constantly develop the productive forces (Jäger and Springler 2015a:80). This involves the extraction and trading of data, selling data one-time or on a subscription basis (Data-as-a-Service, DaaS) or the generation of financial capital through personalized

advertising, both of which are a form of data monetization (Zuboff 2019:63–70). However, it could also involve the indirect monetization of data via optimization companies' processes and operations via data or enhancing product development (Ofulue and Benyoucef 2022:522, 534, 543). Additionally, data capitalism has brought forth a race for infrastructure and R&D investments. This race is driven by venture capital and has transformed investment strategies, with focus on high-risk, high-return opportunities. However, this race is not only taking place in the private sector, states also play a crucial role in funding early-stage research or essential foundational infrastructure for technologies – like what is happening with data spaces currently in the EU. For the example of China, the dependency of the development of the digital economy on both private investment and strategic state support to enhance infrastructure and build-upon technologies is particularly evident (Ding and Chai 2023:37, 40, 42).

2.2. Data Colonialism and Emancipatory Potentials

Colonialism is a historical consequence of capitalism – it can be seen as an extension of capitalist expansion. Unlike traditional capitalism, data capitalism appropriates life itself, not just labor and land. The ongoing dynamics lay the basis for data colonialism where digital platforms create societal conditions for data exploitation. The term data colonialism is strongly attributable to the work of Nick Couldry and Ulises Mejias, who saw value creation from data as fundamental appropriation and resource extraction. This process entails structuring life in such a way to produce data and synthesizing the resulting data points to generate economic value (Couldry and Mejias 2019:338).

Contemporary data practices, like datafication and data-dependent technologies are deeply rooted in colonial histories and not merely analogous to natural resource extraction (Gray 2023:6–8). Datafication relies on complex social networks and political ecologies, involving both local bridgeheads and hierarchical power structures. It also emphasizes the long lifecycle of data, demonstrating how colonial powers have amassed and repurposed data collected by local partners for various unforeseen uses over centuries, thus presenting a new model of the datafication process that involves consideration of both its collaborative creation and enduring utility (Cieslik and Margocsy 2022:363–65).

Data is, however, not just another commodity, as it has unique socio-material attributes that make it an object of dispossession, producing value from difference and reinforcing colonial and racial hierarchies. This process is particularly evident in fields like migration governance,

where data-driven technologies create and sustain inequalities in how different groups of people are allowed to move internationally (Gray 2023:11–13).

The reordering that takes place through datafication perpetuates colonial epistemic violence, transforming social relations and creating new property relations, thereby expanding the racial regime of ownership in the digital age (Gray 2023:15ff). This new form of colonialism involves multiple centers of power, primarily the United States and China, further blurring traditional geographic divisions of the Global South and benefiting elites on a global scale (Couldry and Mejias 2019:337). Similarly, the merging of political economy and ICT is seen as ‘new imperialism’, where economic participation relies heavily on ICT capabilities. Institutionalized policies, such as the Free Trade Agreement (FTA), exacerbate digital divides, with control and ownership dominated by powerful institutions. These institutions favor industrial-free market states under the guise of global governance, ultimately serving Western interests. It is important to note, that capital does not find every population equally appealing. Just like previous capitalist forms, data capitalism selectively targets specific section of the public, ignoring others. This selective engagement exacerbates social marginalization, particularly in regions with already existing social inequalities (Aouragh 2015:498–500).

Some authors have questioned the adequacy of the term data colonialism within digitally divided societies. Segura and Waisbord argued that the use of the term ‘data colonialism’ complicates the analysis by diminishing the intrinsic violence of historical colonialism. They have stated that colonialism inherently involves violent land and population takeovers, whereas data capitalism, though dehumanization by converting populations into resources, does not employ physical force. It operates through subtler methods of value extraction. In addition, religious conquest and indigenous enslavement were central to colonialism, unlike the corporate procedures of digital giants, which, despite their coerciveness, follow standard legal frameworks (Segura and Waisbord 2019:416).

Couldry and Mejias have emphasized very clearly that they do not want to equate historical colonial forms with modern exploitative mechanisms. Rather their intention was to point out the *functions* that justify the exploitation of resources and extractivism. They intended to show that ways out of such systems are only possible if the “*the underlying rationality that enables continuous appropriation to seem natural, necessary and somehow an enhancement of, not a violence to, human development*” is combated. Moreover, they see strong parallels in these

functions and rationalities, from historical to data colonialism (Couldry and Mejias 2019:339, 345).

Both of the following terms have their justification, while data colonialism draws attention to the exploitative nature of digital capitalism, data extractivism offers a more focused description of the processes at play. However, the assumption that data capitalists follow legal frameworks seems to be naive. As Zuboff has pointed out in her discourse on behavioral surplus accumulation, many processes of extraction are invisible because they are already ubiquitous (Zuboff 2019:200–203). This means that many processes remain undetected and even if they are discovered, there is a lack of regulation enforcement possibilities in place (Coleman 2019:436). The interests of data capitalists are also no secret, Zuboff has quoted Intel's chief strategist underlining that: “[...] *we don't want policy to get in the way of technological innovation*” (Zuboff 2019:208ff).

Both terminology discourses describe that developments in digital society extend capitalism's relentless pursuit of markets, labor, and population control, thereby disguising corporate and state surveillance under the guise of individual freedom and global community (Segura and Waisbord 2019:413). The integrity of the self, essential for making and reflecting on choices, is fundamental to both Western liberal notions of freedom and non-Western philosophies of liberation, and the pervasive tracking in data capitalism threatens this integrity, highlighting the need for resistance (Couldry and Mejias 2019:345).

Socio-economic context on Internet Freedom and Data Protection in West Africa

Freedom House, which performs a comprehensive evaluation of political rights and civil liberties, inherently including assessments of economic discrimination, corruption, and the intersection of economic policies with political power and individual freedoms, has shown clearly that West Africa is disadvantaged in the modern data economy due to various factors that hinder political, societal, and therefore also economic freedom (Freedom House 2024, see Figure 1).

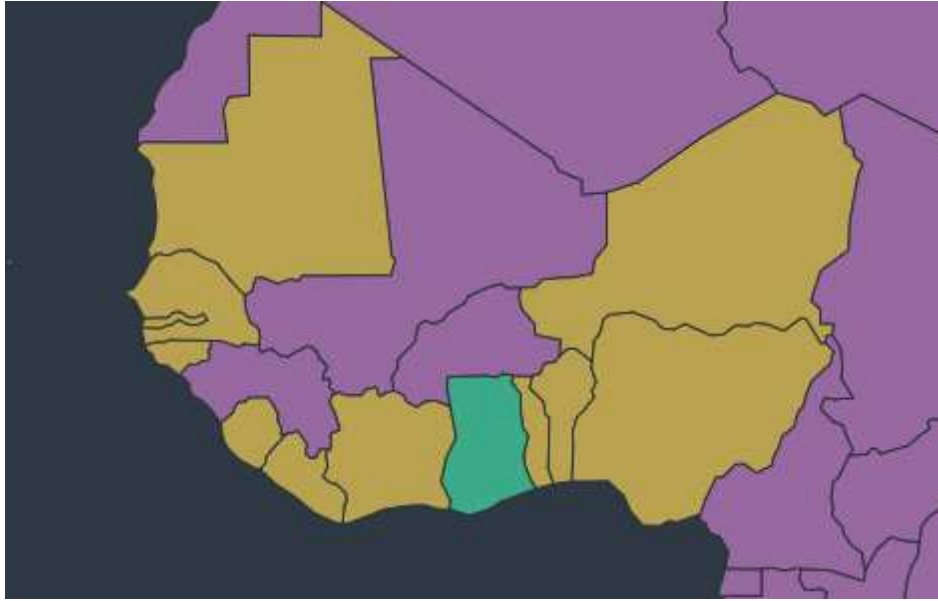


Figure 1 - Freedom in West Africa. Source: Freedom House, 2024.
Purple: not free, yellow: partly free, green: free.

Freedom House's analysis with the title *Internet Freedom* encompassed the evaluation of factors such as access and infrastructure, content limitations, and the protection of user rights against digital repression. For West Africa it showed discouraging or even a desperate status for their fair participation in the global economy that relied heavily on these internet-based factors, as outlined above. For most ECOWAS member states, data on internet freedom is not even available. (Freedom House 2024a, see Figure 2)



Figure 2 - Internet Freedom in West Africa. Source: Freedom House, 2024a.
Yellow: partly free, black: no data available.

Africa Data Protection features a map of data protection laws enacted in Africa. West Africa shows promise with just a few countries not having a Data Protection law enacted (Gambia, Guinea-Bissau, Sierra Leone, Liberia) (ALT Advisory 2024). But the enacted data protection regulations cannot be compared easily, as they are at different stages of development, where some countries have already established their data protection laws in the early 2000s and others just recently. In addition, their requirements vary quite strongly. Some ECOWAS member states have ambitions to align more closely with the GDPR. One example is Nigeria, which has taken significant strides in shaping data governance within the region through several key initiatives and regulations. Nigeria has implemented the Nigeria Data Protection Regulation (NDPR), which ensures the protection of personal data and regulates data processing activities of both public and private sector entities. Additionally, Nigeria has implemented the National Digital Economy Policy and Strategy to transform the country into a leading digital economy (Centre for the Study of Economies of Africa, CSEA 2024). However, without its own digital infrastructure ensuring digital sovereignty, it is enabled by collaborations among governments, private sectors, and financial institutions, which means dependency is not adequately mitigated (Mzinyati 2023).

Nigeria's proactive approach has a broader impact on West African data policies. By setting robust data governance frameworks, with precise demands on data localization towards sovereignty, it is a role model for enabling location technologies (Hlomani and Ncube 2023:109–11). Despite its efforts, Nigeria – as many other West African Countries – faces challenges like gaps in human capacity, financial constraints, and the need for self-determined technical infrastructure. The integration of data governance frameworks is assumed to promote economic growth and associated societal benefits. Currently many African states are working on harmonizing data policies to facilitate trade and investment. Moreover, the (AfCFTA aims to integrate data governance frameworks across Africa to facilitate economic growth and digital transformation. It emphasizes the importance of harmonizing data policies to support cross-border trade and investment under AfCFTA (CSEA 2021:17–19).

The AU's Data Policy Framework, which encourages member states to adopt comprehensive data protection and cybersecurity measures, is seen as a significant guiding document. The framework also advocates for regional harmonization to ensure that data governance policies support economic and social rights and mitigate the risks of digital technologies (Hlomani and Ncube 2023:102–5).

This regional movement shows a trend towards data localization, with international transfers subject to varying conditions across jurisdictions. Some countries, like Senegal, have strong ambitions to foster the data economy nationally and engage with different international partners for support in their data-related strategies, guidelines, and regulations (Bigg et al. 2023:3ff).

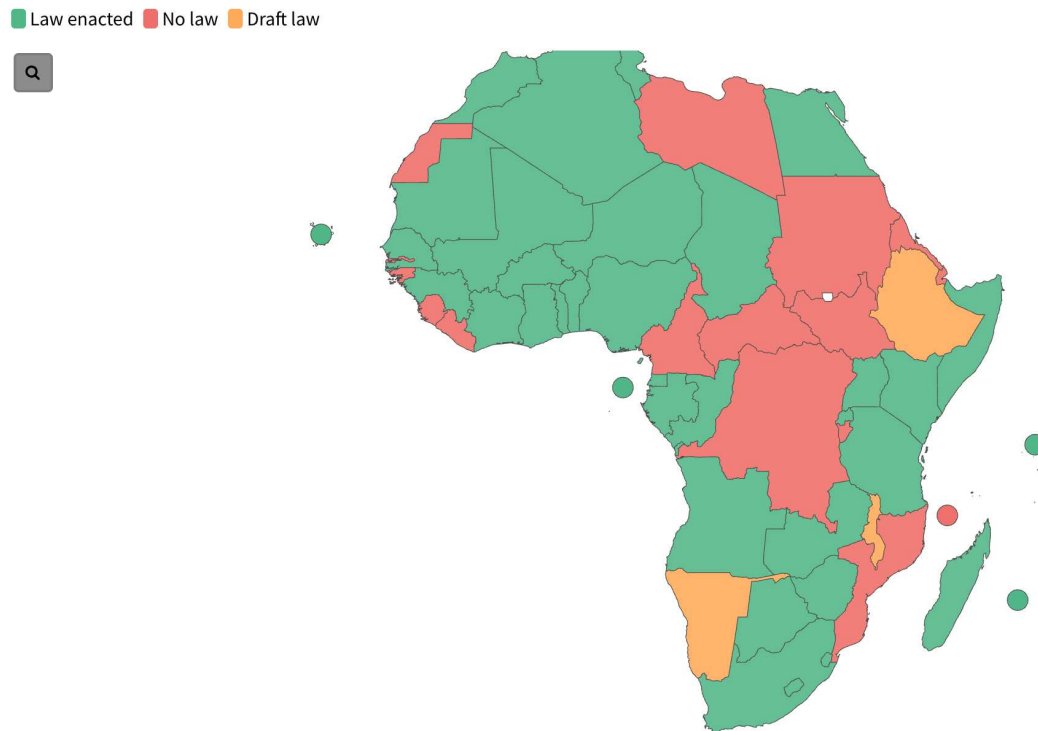


Figure 3 - Data Protection Laws in Africa. Source: Data Protection Africa.

2.2.1. Digital Scramble for Africa and Digital Divide

Africa has been a battleground of global interests for many centuries – politically and economically. Historically, the so-called *Scramble for Africa* was a conquest for territory and had its peak from 1870-1914, at which time the majority of the continent was under European dominion. The European industrialization and its strong demands on resources were a major spur, supported by a narrative of benefit for ‘underdeveloped’ African countries with radical consequences (Mlambo, Masuku, and Mthembu 2024:4).

The *New Scramble for Africa* arose after the end of the Second World War, when Britain became economically dependent on the US and transferred its hegemonic interests to it. At that time – to counter Soviet interests – the US took the lead in maintaining Western interests and security policies. France, as a former dominant colonial power in the region, was concerned with European integration to counter the rising power of the US. One of the global measures undertaken was deepening and strengthening the relations with former colonies, as evidenced

by various political agreements or the *Communauté Financière Africaine* currency union in 1945, which is based on the French franc (Carmody 2016:36).

After various movements to independence, an optimism for inclusive economic and societal development arose on the African continent. However, the post-colonial era created various obstacles related to the remaining governance structures of the colonial past. In the context of Africanization and nationalization, accompanied by respective policies, the ties to colonial-era systems and practices remained. Additional problems due to colonial legacies like the arbitrary and culturally inappropriate delineation of borders in Africa led to instability, civil wars, tribal clashes or religious tensions. This led in turn to further impoverishment and oppression. As Kwame Nkrumah, a leading Pan-Africanist, politician, and statesman from Ghana, claimed: “*Neo-colonialism is also the worst form of imperialism. For those who practise it, it means power without responsibility and for those who suffer from it, it means exploitation without redress*” (Nkrumah 1965:5). The imposition of hegemony has been different since colonial rule officially ended, and now neo-colonial rule is evident in form of financial support and investments. This neocolonial global battle for the strongest influence on and closest ties to Africa threatens to have even more detrimental consequences than what went before, according to Nkrumah (Nkrumah 1965:91).

Neocolonialism brings structural issues that hinder inclusive development and social inclusion in general. For example, there is the question of whether poverty reduction is strongly dependent on other economic growth factors or stronger integration into the world economy. Even if many African states show exceedingly high GDP growth rates, they are still insufficient for making a substantial change in poverty. This would require a significant real per capita GDP growth, alongside various societal changes. These necessary changes are impeded by various structural challenges, including limited access to healthcare, education, economic opportunities, and assorted dependencies (Mlambo et al. 2024:7ff).

After the end of the Cold War, the US showed an increasingly active interest in the African continent and wanted to position the American hegemonic power as untouchable with a so-called *New World Order*. This increased activity in Africa waned during the 1990s due to the small exploitable size of African markets (Carmody 2016:34ff). Nowadays, while there is still market rivalry between France and the US, *common enemies* such as the so-called *Chinese*

Threat or Islamic extremism are bringing the alignments of Western actors closer together (Carmody 2016:36ff).

In the current globalized economy and society, it should be questioned which factors have hindered the realization of Pan-Africanism from outside the continent, since a unity of Africa might not be in the interest of post-colonial hegemonic powers. West Africa has a particularly critical position, given that many of the former French colonies have transitioned into military regimes. By now, there is a widespread anti-French sentiment prevalent in many of these nations. For instance, Mali has cut all its military ties with France and revoked French as its official language. Senegal has implemented measures against French corporations. Moreover, many authors claim that Africa remains at the center of global power competition (Mlambo et al. 2024:9).

The influential Western nations in West Africa have hesitantly supported technology development in Africa in order to intensify the reliance on the hegemonial powers (Mlambo et al. 2024:4). Currently, the discourses in the context of data capitalism specifically relating to West Africa are very euphemistic, touting strong socio-economic developments, convergence towards development goals and a multitude of new opportunities for African companies and individuals (Tafese 2022). Different stakeholders – local like global ones – seem to have explored the enormous potential digitalizing existing markets or building up new digital markets (Tafese 2022:5). It is assumed that the ICT sector has and will have the highest impact on economic and human development, functioning as a key driver for inclusive growth (Ejemeyovwi and Osabuohien 2020:49ff). ICT can have different positive potentials, such as leading to better education, distribution of knowledge, and interpersonal communication, but often it is not clear how these benefits are to be achieved and which negative aspects need to be mitigated, like commercial exploitation or political manipulation (Splichal 2022:100ff). In this positivistic discourse, the materialistic aspect of technology is widely ignored. This neglects how technologies are created and influenced by power structures and the pressure they apply (McCarthy 2017:78).

Current economic discourses see Africa as ‘the’ growing market. Nevertheless, it was shown in the macroeconomic performance report of the African Development Bank Group that there has been a cross-African downturn in overall growth in 2023 spurred by high inflation, with regional variations in intensity (African Development Bank 2024:2ff). Projections for 2024

indicate diverse possible trends, influenced by domestic policies, efforts to reduce commodity dependence, strategic investments in key sectors, and potential recovery in export markets. Considering the strong resilience shown by African economies, reflected in the projected GDP growth of 3.7 percent in 2024 and 4.3 percent in 2025, Africa is the second-fastest-growing regional market, following India – where this might spur activities by data capitalists in the region additionally (African Development Bank 2024:2ff). The projections on African growth are influenced by and strong dependence on strategic sectoral investments like infrastructure and a recovering demand from China, which is a clear indicator of economic dependencies (African Development Bank 2024:18). Market conditions and future prognoses for Africa – and specifically for West Africa – are incentivizing a so-called *New Digital Scramble for Africa*, for which African states do not have sufficiently established protection laws and mechanisms (Coleman 2019:417).

Data capitalism in Africa can be seen as a contemporary manifestation of historical patterns of exploitation and control. Colonial powers have established systems of extraction and domination, exploiting Africa's resources for their own economic gain. As the colonizers of the past centuries used basic infrastructure, like railroads, as the basis for exploitation, so do digital hegemonies with connectivity infrastructure (Coleman 2019:428). Many of those relations have their ties in the Cold War, as African nations often became subjects in hegemonial geopolitical interests (Nkrumah 1965:175–97). Today, data capitalism continues this legacy, with multinational corporations extracting valuable data from African users and economies, often with minimal benefit to local communities. Due to the different hinderance factors for African stakeholders benefiting from the datafication, like the digital divide as a whole, but also the data gap and general infrastructure issues in place, a cycle of dependency is reinforcing existing power imbalances, thereby echoing injustices of the past (Cieslik and Margocsy 2022:356).

The rivalry between the US and China, and also Russia is intensifying across Africa (like it does in Latin America and Southeast Asia). This competition is characterized by those countries seeking to expand their influence through economic investments, political alliances, and military presence. China leverages its Belt and Road Initiative to finance and build infrastructure projects across Africa. This not only fosters economic dependence but also enhances China's geopolitical influence. China is seen as a dependable ally for infrastructure and economic development by many African states (Mlambo et al. 2024:5). The US, in contrast,

is promoting private investments and strengthening trade ties to counter China's growing presence (Mercator Institute for China Studies 2023:4).

From the 2000s onwards, initiatives like the African Growth and Opportunity Act (AGOA) arose, which had the aim of boosting economic ties between the United States and Africa; as well as the establishment of AFRICOM (US Africa Command), a unified combatant command of the United States Department of Defense responsible for military operations and relations with 53 African nations, highlighted their continued engagement (Vermeiren 2013). As France faced and is still facing backlash in the region, the US seen as an ally to France also loses ties – Shurkin claims that the US is in a much more favorable position than France, but “*offers little that might help counter pro-Russia and pro-China views [... and] is not positioned to fill the vacuum France has left behind*” (Shurkin 2024).

Ties between West Africa and China began in the mid-20th century as China sought to build relationships with newly independent African nations, offering economic aid and political support as part of its anti-imperialist stance. Both Russia and China were considered to be self-sufficient in the supply of essential basic materials, opposing the US, UK, and France which were dependent on sources outside their territories (Nkrumah 1965:77). During the Cold War, China provided infrastructure projects, medical teams, and educational scholarships to build alliances in the region (Mlambo et al. 2024:5; Shurkin 2024).

The rise of China in recent decades through its economic liberalization and transformation has been particularly significant geopolitically. The growth rates of the Chinese economy have had a massive impact on the use of global resources. Within a few decades, the Chinese state went from being an exporter of raw materials to a major importer. Chinese economic stakeholders were also encouraged to invest globally through the “go global or go home” strategy with tax incentives. Already in 2003, China accounted for over a third of Africa's iron exports and has shown a radically rapid overall development of trade relations with many countries of the global South (Carmody and Taylor 2016:72ff). In recent decades, these ties have deepened with significant Chinese investment in West Africa's infrastructure, energy, and mining sectors making China a major economic partner in the region (Mlambo et al. 2024:5; Shurkin 2024). This increased involvement from China is reflected in investments – Senegal has received the highest numbers of loans from China in the post-pandemic era (followed by Benin and the Ivory Coast). China is now the second-largest trading partner of Senegal and the trends in other West

African countries tend to be similar. When China started the Belt and Road Initiative in 2013, it was focused on East Africa and the Horn of Africa, but now Senegal's influential role in ECOWAS could spur a more intensified relation to China in the whole region (Clynch 2023).

China has a diverse approach to manifest its influence in the region: In Ghana, Niger, and Nigeria joint ventures are used for economic collaboration, incentivizing cultural adaption from Chinese stakeholders to assimilate with local practices (Ado 2022:1). The narrative around these dynamics is quite twisted: often analysts speak of a *Chinasation of Africa* as China is not known for adapting to local contexts, but via joint venture approach this has seemed to shift (Ado 2022:2). One of the major arguments against these extensive Chinese activities in Africa is that of establishing neo-colonial structures, potentially leading to debt trapping – even though there are some arguments against this narrative, as it is claimed that if regional decision makers in African states decide which projects are to be realized it would not be neocolonial strategy (Vinicius de Freitas 2023:2–5). However, this narrative appears somewhat unconvincing, as it is based solely on the credibility of local decision-makers.

Interestingly, the EU has also claimed to be West Africa's biggest trading partner in 2020 (European Commission n.d.), even though the above outlined sources highlight that China embodies this role. Some sources have claimed that China is the strongest partner for 15 consecutive years for the whole of Africa, and currently also for West Africa. In 2023, the bilateral trade between China and Africa reached a record of 282.1 billion dollars. (Mitchell 2022; Xinhua 2024) Nevertheless, there are ambitions for stronger collaboration between the EU and Africa, catalyzed by AfCFTA, which should create an African single market for economic integration within Africa – in which the EU wants to be a strong supporter (Abimbola 2021).

Generally, compared to earlier stages in history, European and US influence is diminishing in the Sahel and other West African regions. According to a political analyst, Michael Shurkin, the US was not effective in positioning itself on relevant infrastructure projects (Shurkin 2024). This is despite the US (often in the context of NATO, together with France or the UK) having had significant influence during the Cold War, which was further established by aid programs, military cooperation, and promoting democracy and economic reforms in post-cold war era (Ratsimbaharison 2011:274–78).

Digital Divide

The digital divide is characterized by the uneven distribution of digital technology and access, which reflects historical patterns of inequality and exploitation (Musa 2019:67). The digital divide prevents the actual usage of modern technologies to potentially harvest socio-economic benefits (Ejemeyovwi and Osabuohien 2020:51). Initially, observations on the digital divide were focused on who had access to ICTs, but as access increased, the focus moved to how effectively people can and do use technology. The second level of the digital divide involves differences in ICT usage and skills, while the third level is related to how digital benefits translate into social and economic advantages. Digital inequalities are deeply connected to social inequalities. Bridging the digital divide requires addressing access, skills, and the ability to leverage digital opportunities for social improvement. Future policies should involve consideration of these multifaceted aspects to effectively mitigate digital inequalities (Ragnedda 2019:27–37).

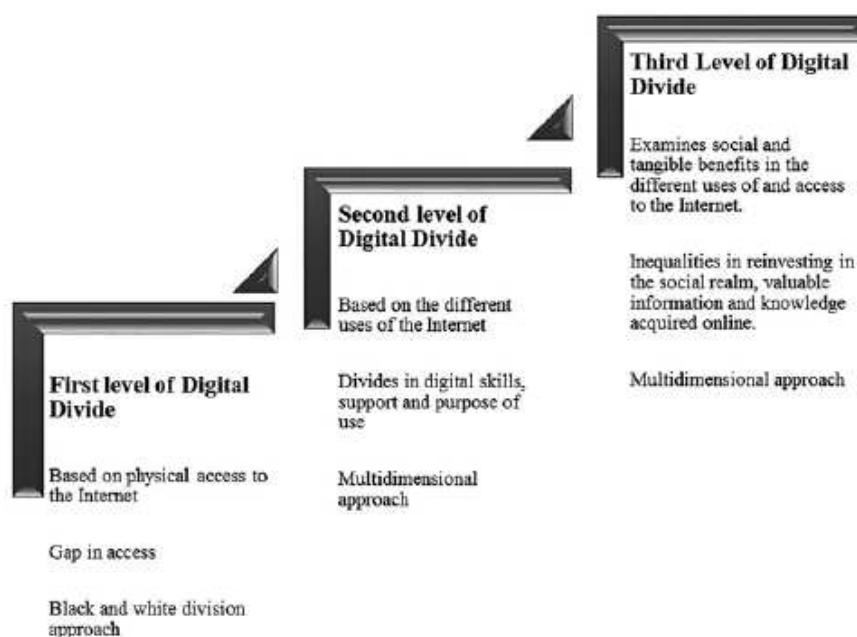


Figure 4 - Three Levels of Digital Divide. Source: Ragnedda 2019:35.

The digital divide has a multi-faceted nature, encompassing both economic and geographical barriers (Lavery and et al. 2018). There are many underlying factors contributing to the digital divide. Economic disparities, education levels, infrastructural challenges, and regulatory environments are key determinants hindering widespread internet adoption and usage (Aikins 2019:67).

Africa's digital dependencies are still shaping its economic landscape, which is heavily affected by the need for an improved digital infrastructure in order to participate more equally in data capitalism. Despite some advancements, Africa still faces challenges in bridging the digital divide – of course with regional differences. Limited access to reliable internet and digital services remains a significant barrier, particularly in rural areas. The continent's data center capacity currently accounts for less than 1 percent of the global supply, indicating a substantial gap that needs to be addressed to fully meet the region's digital needs (Abudho and Beard 2023:8ff).

Comprehensive policy measures that include investing in digital infrastructure, improving education and digital skills training, fostering affordable internet access, and encouraging public-private partnerships to bridge the digital gap could be a feasible solution approach to counter the digital divide. The policy implications suggest that addressing these multifaceted issues can enhance digital inclusion, promoting socio-economic development across the continent (Aikins 2019:69ff).

Many authors recognize that there are barriers such as inadequate infrastructure, funding, and trained personnel and that these need to be addressed for fairer participation on a global scale. Isaacs, Broekman and Mogale have discussed in their chapter in the third volume of the book *Information and Communication Technologies for Development in Africa* the importance of policy formation, donor support, and the need for sustainable practices to ensure long-term benefits of ICT on societal changes (Isaacs, Broekman, and Mogale 2004).

In African societies, mobile phones are considered to be special among other devices due to their accessibility, portability or power efficiency. Mobile phones have become integral to both social interactions and economic activities in Africa. They serve as tools for maintaining social networks and facilitating business transactions, often providing a crucial link for those in remote areas (de Bruijn and Nyamnjoh 2009:36–38). Mobile phones are seen as symbols of modernity and are deeply embedded in local cultures. Their usage is subject to local interpretations, blending traditional practices with new technological opportunities (de Bruijn and Nyamnjoh 2009:82–89). Therefore, in the context of the digital divide, mobile phones could have transformative potential for communication, social interaction, and economic activities in Africa, because these mobile technologies are bridging gaps and creating new opportunities for marginalized communities (de Bruijn and Nyamnjoh 2009:99–102). This trend towards mobile

telephony is also reflected in the fact that fixed telephone operations were only partially privatized or not at all for a long time. Due to the resulting lack of competition from private providers, the prices of the (state) monopolists were very high (Etta and Parvyn-Wamahiu 2003:153). Nevertheless, Etta and Parvyn-Wamahiu see strong limitations of mobile telephony as a driver to exploit “*the full benefits of the information age*” and only lead to “*bringing small dividends*” towards a bridging of the digital divide (Etta and Parvyn-Wamahiu 2003:157).

Data capitalism could also exacerbate the digital divide, with significant portions of the population lacking access to digital technologies and the internet. Florence Etta and Sheila Parvyn-Wamahiu have studied the impact of 36 tele-centers, community technology centers or public access centers that have provided since 2003 communities in rural areas with access to ICT, in 5 countries across Africa. A major starting point for African ICT development occurred in 1996, when the African Information Society Initiative (AISII) was established by the United Nations Economic Commission for Africa (UNECA) (Etta and Parvyn-Wamahiu 2003:151ff). AISII was launched to bridge the digital divide in Africa and integrate the continent into the global information economy. It is focused on improving the quality of life and fighting poverty through enhanced ICT. Supported by various international endorsements and partnerships, AISII has supported 24 African countries in the development of national ICT policies and strategies (among those only 3 ECOWAS countries). Moving forward, AISII has emphasized the integration of ICT initiatives into regional and global strategies to boost Africa’s digital growth. (United Nations Economic Commission for Africa (UNECA) 2003). Etta and Parvyn-Wamahiu have reflected on the point that the purpose of tele-centers was to serve the “*geographically disadvantaged, economically weak and infrastructurally poor*” majority of the specific region but did not sufficiently consider the locally specific factors of heterogeneity and involvement (Etta and Parvyn-Wamahiu 2003:153). One of their major key findings was, that the potential benefits of such community tele-centers are strongly hindered by a strong lack of infrastructure across the continent. This access problem is still particularly evident in rural areas – the tele-centers were concentrated around the capitals of the respective countries (Etta and Parvyn-Wamahiu 2003:154). This situation illustrates that external ICT models cannot be imposed to any specific region without considering local needs and contexts, resulting in unequal access and benefits primarily favoring urban over rural areas. As a result, these initiatives could inadvertently benefit more developed regions or external stakeholders rather than the intended local communities.

Already in 2002, the West Africa Telecommunications Regulators Assembly (WATRA) was founded to create a unified platform for telecommunications and ICT regulators in West Africa. It has the aim of information exchange, best practice sharing, and regulatory coordination among member countries, which include the ECOWAS states and Mauritania. WATRA aims at stimulating investment in telecom infrastructure, delivering affordable communication services, enhancing economic transactions, and improving access to public services. It operates under the ECOWAS Treaty and other regional legal frameworks (WATRA 2024). This approach was started to mitigate potential exacerbation of digital divides and to foster economic benefits cross-region. Even if economic benefits could be achieved from such community-oriented ICT projects, Eghosa Osaghae, a Nigerian political scientist, has offered a critical analysis of such development challenges in West Africa, highlighting that economic development alone will not solve the continent's issues, as there are also issues related to governance, security, and economic transformation. Osaghae has emphasized that Africans share a common colonial heritage and continue to be exploited by the global capitalist system, with many still governed by authoritarian regimes (Osaghae 1994:223). This gives support for a Pan-African approach to data.

2.2.2. Exploitation, Challenges and Alternative Approaches in West Africa

West African countries, while being major producers of essential minerals for technological products, primarily export them for processing in non-African countries, perpetuating their role as exploited sources of raw materials in the global data and technology economy. This presents significant challenges for West African emancipation, as it mirrors historical patterns of primitive accumulation and exploitation, hindering their ability to benefit fully from their own natural resources and integrate into higher value segments of the digital economy (Fuchs 2014:172). The global ICT industry is dominated by companies from the US, Japan, China, Taiwan, South Korea, Sweden, and Finland, with African companies largely absent from this sector (Fuchs 2014:180).

ICTs are products of capitalist market structures that enhance and consolidate existing inequalities. The digital divide discourse often fails to critique these underlying capitalist frameworks, perpetuating the same power imbalances established during the colonial era (Musa 2019:65). Nkrumah has argued that only an All-African Union Government could defeat the consequences of the capitalist monopoly of western firms (Nkrumah 1965:38, 201). Even though many regional economic communities (REC, like ECOWAS) have been initiated since the Abuja Treaty in 1991, including the African Economic Community (AEC) and political

movements like the Organisation for African Union (OAU), which led to the African Union, and are still in place today there has never been a fully realized pan-African government. A lack of political stability, nationalism, weak institutions, and infrastructure have been just a few of the many hinderance factors (Mlambo et al. 2024:8).

While the legacy of colonialist structures continues to entrench inequalities in the digital age, as highlighted by the digital divide discourse, the political landscape in West Africa faces parallel challenges. Nkrumah's vision of a unified African government to counteract the dominance of Western capitalist forces has not materialized, leaving regional entities like ECOWAS dealing with internal and external pressures. These pressures have manifested in recent political upheavals, where ECOWAS faces significant challenges in maintaining unity and sovereignty in the face of regional instability and external influences. Niger, Mali, and Burkina Faso have announced their withdrawal from ECOWAS after being suspended due to military coups, claiming it as a decision of sovereignty. The nations' leaders have criticized ECOWAS for not retaining the founding principles and being influenced by foreign powers, while failing to address jihadist violence. Despite sanctions and negotiations, the military leaders of the three countries have hardened their stance, distancing themselves from France, strengthening ties with Russia, and forming the Alliance of Sahel States to focus on security (Wong 2024).

Many authors speak of the emergence of a 'coup belt' – or a 'coup epidemic' – across West Africa. This is attributed to popular discontent with corrupt and repressive regimes, as exemplified by the political crisis in Senegal, where opposition leader Ousmane Sonko has been jailed and his party banned, leading to widespread protests. Such anti-democratic movements across Africa have a broader impact on the region's political stability (Ikoku 2023:8ff). However, some West African states, that have successfully avoided or overcome such disruptions, have shown that democratic progress is still possible. Effective civil society activism and institutional reforms are crucial for breaking the cycle of military coups in the region (Baltoi 2023).

The coups, internal divisions and continuation of colonial structures have been a stumbling block to Pan-Africanist movements. Today's Pan-Africanists speak of a desperately needed Africanization, that is focused on unity and inclusivity, to be able to address contemporary challenges faced by African communities (Mpofu 2024). The political instability in West

Africa, characterized by frequent coups and weak governance, could be interpreted as hindering the region's capacity for emancipatory development in data capitalism. Local governments may lack the stability and regulatory frameworks to protect their citizens' data rights and promote equitable digital growth. After all, this instability could be fertile ground for foreign entities to exploit local resources and data without significant resistance, further entrenching economic disparities and undermining efforts towards digital sovereignty and inclusive development. Political instability also exacerbates cybersecurity risks, making robust data governance even more critical. The increased frequency of cyber-attacks in the region underscores the need for resilient data protection frameworks, which are currently not yet widely implemented across the continent (Babalola 2023:74ff).

In the past few years, the ECOWAS region has developed different frameworks for ICT that address various aspects of digital transformation and cybersecurity. For instance, they have adopted a regional strategy aimed at enhancing cybersecurity and combating cybercrime, harmonizing ICT policies across member states to ensure seamless connectivity and robust cybersecurity measures. This strategy is focused on increasing cyber-resilience, strengthening cybersecurity capacities, protecting critical information infrastructure, and building trust in the use of ICT. The ECOWAS Parliament has emphasized also the importance of building capacities in cybersecurity and raising awareness about cybercrime. There are ongoing efforts to train professionals and sensitize stakeholders about the significance of cybersecurity (ECOWAS Parliament 2020). Additionally, ministers from ECOWAS member states have been working towards a unified approach to secure a digital environment that supports regional growth and development. This includes developing regional instruments for electronic transactions, personal data protection, and anti-cybercrime measures (ECOWAS 2020). These efforts are part of a broader initiative to leverage ICT for economic and social development in the ECOWAS region, aligning closely with the objectives of AISI. Interestingly this initiative is supported by the European Union and Expertise France, a public agency created by the French government specializing in international technical cooperation. Data sovereignty has also become a topic of the ECOWAS Cyber Security Initiative since Germany's G7 presidency – Germany is a forerunner when it comes to projects focusing on ensuring data sovereignty, security, and interoperability within the European context. The GIZ (*Deutsche Gesellschaft für Internationale Zusammenarbeit*) played an essential role in this and also influenced countries like Senegal to adopt digital and data sovereignty into their national data strategy (ECOWAS 2022, 2023; Gaia-X Association 2024c; Smart Africa 2023).

Establishing data sovereignty in West Africa could be an effective approach towards reclaiming control over the continent's digital resources and mitigating the impacts of data colonialism. By asserting data sovereignty, African nations can govern the collection, storage, and use of their data according to their own laws and interests, thus ensuring that the benefits of data-driven innovation and economic growth are equitably distributed within the continent. Measures taken by forerunners like Nigeria or Senegal aim to enhance privacy, security, and national control over data assets, reducing dependency on foreign data centers and technology providers (Maswabi and Nkala 2022).

The African Union's Digital Transformation Strategy for 2020-2030 further underscores the importance of data sovereignty by promoting the development of localized digital infrastructure and a harmonized regulatory framework across the continent. This strategy envisions the establishment of a Digital Single Market, which would facilitate the free flow of data within Africa while protecting personal data and enhancing cybersecurity (Gopaldas 2022). In that sense, data sovereignty could support the path to the potential of emancipation, as it allows African countries to build robust digital economies, foster innovation, and ensure that the wealth generated from data remains within the continent to support sustainable development and socio-economic progress (Gopaldas 2022; Maswabi and Nkala 2022; Monyae 2022).

2.2.3. Emancipatory Potentials in Data Capitalism

Based on the contexts and dynamics derived so far, a discussion is presented in this section about how individuals, companies, and regulators in West Africa could act to reduce dependencies, achieve a more self-determined handling of data, and mitigate the consequences of data colonialism respectively data extractivism.

Marx emphasized the struggle between the bourgeoisie and the proletariat over the control of the means of production as something important to consider. The control of data is primarily determined by three factors: Legal frameworks and regulatory compliance, technological infrastructure, and access and usage sovereignty. In the absence of these factors, West Africa could remain vulnerable to data colonialism, where foreign entities exploit local data resources without adequate oversight or benefit to the local population. Strong regulatory frameworks, technological infrastructure, and control mechanisms are essential to build a resilient data ecosystem that supports local empowerment and economic development not limited to elites

(King'ori, Quee, and Dorwart 2023). The first aspect, regulations and compliance, has involved strong dynamics over the past years, as outlined above with regard to the NDPR or cross-regionally with the Act on Personal Data Protection within ECOWAS (ECOWAS Act) and the Malabo Convention. Interestingly the ECOWAS Act is the only binding instrument (Babalola 2023:2ff, 6; Cooper and Mkhize 2021; King'ori et al. 2023). Despite these dynamic advancements, gaps and challenges for regulatory compliance and legal frameworks in West Africa still exist, where the significant variability in the implementation and enforcement of data protection laws leads to inconsistencies across the region. Therefore, coherent harmonization is required for any improvement. Additionally, many countries face resource and capacity constraints, limiting the effectiveness of regulatory bodies. The incoherent sectoral policies create regulatory silos, complicating any efforts to establish cohesive data governance strategies (Babalola 2023:4ff; Cooper and Mkhize 2021).

The availability and quality of technological infrastructure, including internet access and data centers, are critical for potential economic integration. Locally installed, robust infrastructure could support the secure storage and management of data, influencing who can effectively control and process data. This requires the building of regional data infrastructures and the enhancement of institutional capacities in order to manage data effectively, which is reflected in the African Union's Data Policy Framework and must be practically implemented by local stakeholders (King'ori et al. 2023). There are substantial financing challenges for infrastructure, with many projects failing to reach completion due to weak feasibility studies and business plans. Regulatory and policy environments often lag behind, further complicating the implementation of digital infrastructure projects (de Feydeau, Menski, and Perry 2022; Lakmeeharan et al. 2020; World Bank 2024). Nonetheless, there is a growing number of data centers located in West Africa, which could indicate a positive momentum towards improving the technological infrastructure (de Feydeau et al. 2022).

The third factor, access and usage sovereignty are crucial in order to ensure effective control over data. This involves implementing strong access controls, authentication mechanisms, and policies governing data sharing and usage, which goes beyond data localization. Data sovereignty gives states and stakeholders the right to formulate digital rules in line with their interests. It is reflected in the AU's data policy framework, which stresses that states should prioritize politically neutral partnerships to avoid foreign interference into domestic affairs. Data Spaces are a tool to ensure data sovereignty by design (see chapter 2.3.) – David Monyae,

Associate Professor of International Relations and Political Science at the University of Johannesburg has even suggested a similar approach like the EU: *“Continental rather than national data sovereignty is the right way if Africa is to enjoy the economic dividends of the digital revolution. A continent-wide sovereign cloud infrastructure, similar to the proposed GAIA-X cloud network in Europe, to store and process data underpinned by shared African values and interests if Africa is to harness the digital revolution to its benefit.”*

These three key factors are embedded in a broad context and require changes on a global level. Marx advocated for international solidarity among workers. In data capitalism, this would mean global cooperation to establish standards and regulations that prevent data exploitation by multinational corporations. International frameworks could ensure that data governance respects the sovereignty of individuals worldwide.

The Global Data Alliance is an international coalition of companies advocating for policies that promote the free movement of data across borders. Their mission is focused on ensuring data flows to support economic growth, innovation, and global commerce. The alliance works on issues such as privacy, cybersecurity, and regulatory harmonization. Their stated claim is to ensure trust in the digital landscape across borders (Global Data Alliance 2024). In the context of data extractivism, the Global Data Alliance’s composition which includes many tech giants, is problematic due to potential conflicts of interest. These large corporations might prioritize their profit motives over public interest, leading to biased policies that favor unrestricted data flows without adequate safeguards for privacy, data sovereignty, and equitable data sharing. This can exacerbate issues of data exploitation.

While the concept of global cooperation and the establishment of international frameworks to regulate data capitalism is idealistic and appears necessary, several critical challenges must be addressed. First, achieving international solidarity and consensus on data governance is exceedingly difficult due to varying political, economic, and cultural interests among regions, nations, and continents. Furthermore, multinational corporations possess significant influence and resources, often surpassing those of individual governments, which complicates the enforcement of regulations. Additionally, the rapid pace of technological advancement can outstrip the ability of international bodies to formulate and implement effective standards, potentially leaving loopholes for exploitation. Therefore, while the vision of global cooperation

on data is compelling, the practical obstacles and inherent power imbalances present barriers that must be critically examined and addressed.

“The world is no longer-divided into East and West, but into digital and non-digital. The motto is: Whatever can be digitized will be digitized” wrote ten Hompel and Schmidt (p. 276ff). The discourse of techno-utopianism continues to feed data capitalists’ desire for totality, reflecting in limitless technological progress (*“The Big other will solve all of humanity’s problems”*). Zuboff clearly sees this narrative as a strategic measure to distract individuals from the legitimization of surveillance capitalism, finally leading to a *quiet surrender*. In modern data-driven capitalism, Zuboff sees a historic deviation from the norm due to the data capitalists’ ratio in knowledge, power, and wealth (trillions of market capitalization). The major deviation and resulting issue, compared to the times of Marx – where the power of his idea was not sufficient to realize his vision – today’s capitalists have radical power to implement their ideas, which are scarcely backed up by theories. This limits the space for critical inquiry (Zuboff 2019:404–6). *“The surveillance capitalists reverse the normal sequence of theory and practice. Their practices move ahead at high velocity in the absence of an explicit and contestable theory”* (Zuboff 2019:406). While they exercise this instrumental power, they legitimize their uncontrolled expansion with the narrative of making the world and society better and fairer (Zuboff 2019:407). This seems to leave little room for emancipatory approaches to reality.

The dominance of large companies on Web 2.0 platforms shows that these spaces are not democratic but are controlled by powerful entities, which leads to an ideology that ignores the underlying power structures (Fuchs 2014:124). Platforms are controlled by private corporations, which prioritize profit over communal interests. This corporate control exposes amongst others activists to surveillance and repression, underscoring the need for communication networks truly owned and managed by the people to support democratic and common governance effectively (Fuchs 2014:331).

Researchers from the field of technology assessment, have argued that emancipation in data capitalism involves leveraging technology to liberate individuals from oppressive conditions by integrating democratic principles into technological design and implementation. This approach, termed Emancipatory Technology Studies (ETS), calls for critical examination of the socio-economic conditions driving technological development and public participation to ensure technology serves broad social interests rather than just private economic gains (Frey et

al. 2021:20ff). Adapting this to West African contexts would require addressing local socio-economic and political dynamics, ensuring technology solutions are inclusive, culturally relevant, and accessible to marginalized communities, thereby promoting equitable development and empowerment. This necessary context-specific approach to understanding data capitalism, considering the unique political, economic, social, and technological contexts of the Global South, is also reflected in different forms of data activism (Segura and Waisbord 2019:414ff). The insights obtained from Cape Town's data activism, as discussed in an article by Ricker et al., provides a model for engaging local communities and leveraging open data initiatives to address social inequalities and empower marginalized populations (Ricker, Cinnamon, and Dierwechter 2020:371). This approach applied in West Africa would require a localized adaptation that respects the unique cultural, economic, and technological landscape of the region; however, it is a solid best practice example for community engagement with respect to data and technologies.

Even if the complex relations of exploitation and domination in data capitalism may at first glance seem to leave little room for emancipatory potentials, it is a central task in CIPE to think about overcoming these and thus about liberating the disadvantaged. In this context, this thesis contains a contribution to the critical-idealistic approach for an egalitarian society in data capitalism (Jäger and Springler 2015:83).

Christian Fuchs has outlined, that there is sufficient potential for radical transformation. Information technology drives down the marginal cost of information to zero, which could cause capitalism to collapse and post-capitalism to emerge – at least according to some critical scholars. However, such analyses often overlook the impact of class struggle on the rate of profit and surplus value. Since the 1970s, computerization has had mixed effects, increasing both the organic composition of capital and the rate of surplus value, resulting in fluctuating profit rates and economic volatility. The 2008 crisis highlighted the contradictions of neoliberal finance capitalism and has led to an ideological shift towards authoritarianism and nationalism (Fuchs 2019:64–66). The fluctuating profit rates, and economic volatility of data capitalism highlight the need to challenge data monopolies and support open access initiatives. Emancipation would therefore require community-controlled digital infrastructures and dismantling capitalist structures that perpetuate exploitation. Despite its exploitative dynamics, data capitalism also fosters potential for autonomy and resistance, as seen in the rise of open

access publishing, thereby challenging the traditional high-profit monopolies of academic publishers by offering free and less restricted access to scholarly work (Fuchs 2019:62).

In addition, to a new more equally design standard of technology, policies will play a key role. Zuboff has considered Data Protection policies like the GDPR as a potential counterweight to the instrumentarian power of surveillance capitalist, but critically questions whether “*GDPR can move out in front of the Big Other*” and has emphasized that this needs to be a collective movement from society, not leaving the fight for data privacy and sovereignty to individuals (Zuboff 2019:482). One new movement of collective action in the field of privacy is None of Your Business (NOYB), initiated by privacy activist Max Schrems, which acts as a "professional privacy enforcement". NOYB aims to bridge the gaps between regulation and practice and unite user groups to form coalitions to maximize the realization of the *right for privacy* (Zuboff 2019:486). Despite NOYB’s primary activities in Europe, their model could serve as inspiration for similar movements in West Africa. By adopting similar approaches, West African activists and organizations could close the gaps in data protection and raise privacy awareness. This kind of collective engagement could lead to stronger data protection laws and enforcement in the region in the long run. A Marxist approach would additionally advocate for the collective ownership and control of data and digital infrastructure. This could either involve state ownership or cooperative models where communities have a say in how data is processed and used. In addition, the collectively designed policy and enforcement approaches must be homogenized across the continent, if not even globally so that individual countries or regions with lower data protection contexts do not become hotspots for exploitation by data capitalists.

2.3. Data Spaces for Emancipatory Potentials

As pointed out in chapter 2.1.1., the Internet, and all built-upon technologies, have per se emancipatory potential. Nonetheless, they also have parasitic properties for oppression. ICT and data technologies have been designed, developed, and applied for positive as well as negative use (Splichal 2022:101). In this section, it is elaborated, how digital ecosystems – especially, federated and sovereign ecosystems, like data spaces – can be used for socio-economic profit.

We live in times of the Fourth Industrial Revolution which has led to a massive increase in capabilities and cost reductions in almost every economic sector through advances in technologies such as AI or blockchain. As described in the chapters above, these circumstances fundamentally change the way we live and work – just as electricity or the Internet have done in the past decades and centuries (Scheier and Held 2019:7).

2.3.1. Digital Ecosystems and their societal benefits

In the 2024 Global Review of National Developments, co-produced by the World Summit Award, the Government of Telangana, and the Digital Empowerment Foundation, it is shown that digital ecosystems can have a positive impact all over the world. Over 20 local experts have written about successes and hurdles in their national digital developments from different regions of the world, focusing on social impacts. However, it is also highlighted that there are still significant challenges that need to be overcome, especially in West African countries (Bruck and Manzar 2024). The review also contains a presentation of two national perspectives from West Africa: Ghana and Nigeria. Dorothy Gordon, a Ghanaian specialist for digital technologies for developments, has described the national situation in Ghana as “*vibrant and chaotic, exciting and yet challenging*” (Gordon 2024:75).

On the positive side, the digital landscape is very dynamic, showing gradual growth with regard to technology adoption over the past decades, additionally accelerated by the COVID pandemic (Gordon 2024:75, 77). Many innovative startups are building digital solutions for social impact, mainly in the fields of economic growth (e.g. via equipping previously unbanked entrepreneurs and citizens), zero hunger (e.g. with platforms for small scale farming), industry innovation (also in creative industries, supporting artists to monetize their work), and infrastructure (B2C communications without internet). In Ghana there are a variety of locally adopted e-businesses using online channels and mobile money. In these fields, the number of female technology entrepreneurs has risen and illiterate informal entrepreneurs can also benefit from different technologies (Gordon 2024:75–77). Ghanaian entrepreneurs attract a lot of funding from different global stakeholders, like venture capital, UN agencies or GIZ. In addition, the local government strongly invests in policies, legal frameworks, and regulation and infrastructure, spurred by intensified debates and more awareness on the governmental level (Gordon 2024:77ff). These economic dynamics show also positive societal impacts, like collective organization of individuals or it enables them to participate more actively in public discourse and governance (Gordon 2024:80ff). Ghana is also a forerunner in West Africa when it comes

to e-government services, available also in rural areas. These services and other effects lead to the general perception of digital technologies as empowering. This is especially relevant for mobile money, as it boosts earnings and supports local entrepreneurs to expand their markets – also in informal sectors. This technology also shows a high maturity, as there is seamless interoperability between mobile money solutions provided by different telecom operators. Despite digital advancements in various fields, Gordon sees the “*financial sector as winner of the digital transformation in Ghana*” (Gordon 2024:82ff).

Despite the progress, there are not all positives, especially in terms of infrastructure. Many positive sentiments can be seen, such as local players moving away from proprietary systems towards OSS technologies that allow innovation to be driven faster and reduce costs for customers. There are also activities around Digital Public Infrastructure that promote and enable networked open technologies, governance and a collaborative community of innovative but even competitive market players (Gordon 2024:75, 79ff). Nevertheless, internet shutdowns are still a reality. For example, in 2024 an underwater internet cable was damaged, which left the entire nation without internet. Apart from this, the cost of internet in relation to income is still very high, which limits usage – even though internet in Ghana is relatively cheap compared to other African countries (Gordon 2024:83).

Apart from infrastructure problems, Ghana also continues to suffer from a skills shortage. There are many reasons for this, including a high level of illiteracy, but also competition for skills, i.e. the poaching of local professionals by large international corporations. Even those who stay in Ghana often work remotely for more powerful big tech corporations. As a result, local start-ups and companies have massive problems in terms of staffing, which severely restricts their growth. This makes many smaller companies easy prey with regard to international acquisition. In the academic sector, the shortcomings are mainly due to the fact that curricula cannot keep up with the rapid technological development and existing fields are barely networked; Gordon sees a great need for relevant interdisciplinary training. At the user level, there is a particular need for digital literacy so that end users can recognize fraud and misinformation and thus develop awareness for self-protection (Gordon 2024:75, 79, 83ff).

The success of the local digital economy is often also held back by external dependencies, e.g. the use of AI for different purposes. In addition, there is still room for improvement in the exchange between local stakeholders in order to reduce redundancies in what is done by

analyzing where previous projects have failed or what already exists that can be reused or expanded (Gordon 2024:75–77).

A particularly critically discussed point is the involvement of government, which often displays a “cash cow” mentality in the sense of new or increasing taxes, and thus wants to “milk” the sector. This creates disadvantages for local female entrepreneurs. However, there are opportunities for the state to have a mitigating effect on the digital divide (between educated and illiterate, urban and rural, young and old). This is because the digital divide is a present and painful reality – still more men than women own cell phones, internet service quality is significantly worse and less reliable in rural areas than in urban areas, and older people need support to use digital services such as e-government. Therefore, local stakeholders generally question whether policy makers and political leaders have an adequate understanding of how to shape digital growth with positive social outcomes (Gordon 2024:77–79, 84).

Gordon’s overall recommendations are (Gordon 2024:86):

- National awareness campaigns and whole government approaches,
- Encouragement for products and services in local languages and translations,
- Engagement and education for citizens’ awareness, and
- Infrastructure investments led by the governments.

Nigeria shows similar tendencies to Ghana, with numerous social impact ventures, boosted by mobile technology and fintech innovations. The fintech sector has in particular seen thriving dynamics. According to Yemi Keri, a Nigerian technology executive and entrepreneur, this enhances social inclusion and supports poverty eradication efforts. The financial inclusion seems to be increased by the use of mobile money technology. Nigeria shows the highest rate in the region of support systems like tech hubs, incubators, and similar (Keri 2024:193ff, 199). The government has taken numerous action in the past few years, establishing new policies, institutions, and funding. A few examples are the Nigeria Startup Act 2022, the National Council for Digital Innovation and Entrepreneurship, and the Nigerian Copyright Commission, Trademark, Patent and Design Registry. In terms of fundings Nigeria has mobilized USD 618 for the technology sector and creative industries, recognizing ICT as crucial for education, healthcare, and agriculture. Additionally, local stakeholders benefit from fundings via Development Finance Institutions, government grants, angel investors or local venture capital (Keri 2024:195).

In general, internet and smartphone usage in Nigeria has been growing steadily since the 2000s, it has a broadband penetration of 44.5 percent and 200 million mobile subscribers, making it Africa's most dynamic mobile market. This also has led to a significant increase in e-commerce, which gives local entrepreneurs greater access to the market (Keri 2024:193ff, 196).

Keri, like Gordon, sees the internet as a good tool for political participation and social mobilization, thereby promoting political issues in public discourse and holding authorities accountable. She has stated that the internet promotes local democracy. Interestingly, Keri gives as examples of social networks that are used, but only the big hegemons and not local initiatives or platforms (Keri 2024:193ff, 197).

With increasing digitalization, Nigeria is also experiencing serious challenges, especially cyber security issues, such as threats, fraud, and data privacy concerns. In addition, people with low digital literacy are exposed to immense misinformation, fake news, and political propaganda on various social media. Keri has pointed out that there is a generally low digital literacy rate and that many people do not have the skills to actually use the technology available. Similar to the case for Ghana, universities need to catch up with the rapid development of technology in order to equip graduates with the appropriate skills. Local stakeholders in the Nigerian data economy therefore often do not know how to prepare data for potential use, and often this data is not even collected by local companies (Keri 2024:193, 197, 201–3). In addition, the infrastructure in Nigeria has major shortcomings, often resulting in limited connectivity or network coverage, or there is not enough energy available in the first place. Rural inhabitants are naturally more affected by this, which is reflected in similar trends regarding the digital divide as seen in Ghana and is accompanied by a wide range of external dependencies (Keri 2024:201ff).

Keri's recommendations for improvements can be summarized in the following points (Keri 2024:193, 207):

- Policies must focus on inclusivity,
- More solid infrastructure must be established,
- Technology should empower marginalized communities, and

- National experts, organizations and policy makers need to collaborate closely to ensure that policies are tailored to the specific needs of different national groups (she hints to the National Inclusion Strategy).

2.3.2. Vision of Data Spaces – Sovereignty via Federation

Data exchange is nothing new as data has been exchanged for many decades, especially in industry, and data exchange standards like Electronic Data Interchange are firmly established. However, the use and scope of such previous standards are sometimes reduced, e.g. between an Original Equipment Manufacturer and its suppliers, which is pure data provision. The intention of the movement around Dataspaces is to go beyond this, to share and exchange data for a whole ecosystem of companies and for a variety of use cases. The data provider has a range of so-called controls – the technology can control who is allowed to discover the data in the data ecosystem (access controls) and for which purposes they are allowed to be used (usage controls). The data exchange takes place end-to-end, i.e. from the provider directly to the recipient, without any centralizing and hoarding of data. Data spaces integrate ‘sovereignty-by-design’ which means that the determination and execution of access and usage restrictions are automatically technically enforced (Otto 2022a:4ff).

Data space technologies, such as those developed in the communities of Gaia-X or IDSA, are also not new from a logic perspective. The notion of these federated ecosystems emerged already 15 years ago in computer science and was spurred to practice by the growing need for sovereign and interoperable data infrastructures in the context of global digitalization and the increasing dominance of US and Asian tech giants. Different initiatives were launched to foster this technology stack, like IDSA in 2016, and Gaia-X in 2019. From these first initiatives many others formed (e.g. the Data Spaces Business Alliance, DSBA, together with the Big Data Value Association and Fiware, as well as the Data Spaces Support Center (DSSC), funded by the European Commission; and many national ones additionally). The purpose of all these initiatives is to create a federated and secure data infrastructure that enables a trustworthy and transparent data economy. The development of data spaces is closely linked to advances in the internet and cloud technologies. Companies such as Amazon Web Services (aws), Microsoft and Google have revolutionized the way data is stored and processed over the past years and become so-called hyperscalers, i.e. large cloud service providers offering services for computing and storage (Halub 2023; Otto 2022a:7).

The stated alliances promote the concept that data can be shared or exchanged and processed securely and trustworthily without losing control over the data. The initiatives promote collaboration between different stakeholders (Gaia-X Association 2024a; GXFS 2022). A central goal of all the initiatives is to create standardized and interoperable frameworks for data exchange. This includes the development of federated catalogues that enable a standardized market overview and comparability between providers. Such standards are critical to manage the complexity of today's data and cloud technology markets and promote collaboration across different ecosystems (Otto et al. 2021:14, 17–19).

Maintaining European economic competitiveness was a key factor for the standardization dynamics (Industriellenvereinigung 2023:4). The public investments incentivized companies, some of which are even in direct competition with each other, often cooperate spurred on by the verifiable trust factors in these digital ecosystems. This applies both to the national and cross-European scopes in the frame of the Common European Data Spaces (European Commission 2020a; Halub 2023). Two aspects of the initiatives have particularly emancipatory aspects: 1. the focus on sovereignty on the data layer and 2. the directive to make the developed software available as open source so that a large number of stakeholders can benefit from it (Halub 2023; Otto et al. 2021:16, 28).

Gaia-X initially positioned itself as a counter-movement to hyperscalers, but now expects them to participate equally, because many of the sovereign solutions at data level are based on the cloud setups of hyperscalers and many stakeholders have invested heavily in cloud storage systems, which is why they might be hesitant to change that (Krempl 2020b). This could be a hinderance factor with regard to reducing the overall dependency on digital hegemony. Although Gaia-X did not become a European cloud alternative as originally intended, the technology the initiative brings forth still offers potential advantages for transparency, credibility, and trust in the digital sphere.

Data spaces should above all foster collaboration. Catena-X is a prominent data space example, where large parts of the competitive German automotive industry joined forces to build this one ecosystem with one vision, to establish integrated, trusted data chains for production and supply. While this is a promising first step, as with all emerging technologies, several questions regarding feasibility, potential benefits, and challenges remain unresolved (Otto and et al. 2021:7). It has not yet become clear who benefits the most from such a network. It is of course

possible that the dominant stakeholders in the value chain may gain the greatest benefits, while the advantages of those at the beginning of the supply chain, such as raw material suppliers, might remain limited.

Data spaces fundamentally differ from traditional data exchange concepts by emphasizing a decentralized, federated approach to data sharing. In contrast, traditional data exchanges often involve centralized platforms where data is aggregated and managed by a central entity. Data spaces are focused heavily on governance frameworks and trust, promoting secure and compliant data sharing without centralizing the data itself. This model enhances privacy, security, and trust compared to conventional data exchanges (Spiekermann 2021). This logic has resulted in three types of dataspace: Closed Ecosystems, Open Ecosystems, and Federation of Ecosystems. Although these differ in their requirements for interoperability, sovereignty, trust, and security, they all require the same core technological components (Otto 2022b:10–13). According to the IDS Reference Architecture Model (IDS RAM) for data spaces, these building blocks must be standardized to ensure interoperability within and between data spaces (Pettenpohl, Spiekermann, and Both 2022:30). These are the minimum requirements for core components of data spaces in order to comply with the standardizations of the various organizations. Depending on the domain and use cases, many more features may be necessary. Listing all domain and use case specific features that were developed in projects would go beyond the scope of this research and would not add any value to it, which is why it is not discussed any further here.

Connector(s)

Connectors are key components for data spaces in ensuring sovereignty and building the interface between internal systems and the ecosystem connecting participants. Such connectors can encompass a variety of functionalities like the enforcement of access and usage policies or system monitoring and can be enhanced by custom services like visualization (Pettenpohl et al. 2022:32). In recent years, many organizations have made effort to develop code for these connectors and to standardize them (e.g. the Dataspace Connector from Fraunhofer ISST, which was later merged with the IDS Connector; the FIWARE True Connector; or the EDC Connector, whose standard now seems to have established as the status quo) (Amazon Web Services 2024; IDSA 2021b, 2021a; Spiekermann 2021). Many of these connector functionalities have also been extended by the Gaia-X Federation Services project (Gaia-X Federation Services 2024; Gaia-X Technical Committee 2022). The IDSA publishes a report in

which a variety of connectors were summarized with different base codes adaptations. In addition, the SIMPL project (smart, interoperable middleware platform) plays an essential role for interoperability on a pan-European level (European Commission 2024b; Giussani, Steinbuss, and Gras 2024).

Identity Provider and (Gaia-X) Digital Clearing Houses

The connector feature makes it possible to create, manage, monitor, and validate identities to prevent unauthorized access to data sources. Each of these contains self-descriptions and verifiable attributes (Pettenpohl et al. 2022:33). Identity providers in data spaces manage access control and ensure secure, trustworthy data exchanges among participants through identification, authentication, and authorization. Key components include Certificate Authorities for issuing identity certificates, Dynamic Attribute Provisioning Services for real-time attribute validation via tokens, and Participant Information Systems for storing and providing business-related participant information. These elements, along with adherence to standards like OAuth 2.0 and eIDAS, facilitate seamless and secure data sharing within the ecosystem (IDSA 2023a, 2023c, 2023b).

The Gaia-X Digital Clearing House (GXDCH) services were established for the verification of these identities. The GXDCH is a further development in the data space landscape, in contrast to the clearing house defined by Pettenpohl et al. (2022:33) it is focused on governance and facilitating transactions within a specific data space trust framework. The GXDCH is a decentralized network of nodes that verify compliance with Gaia-X standards, ensuring participants adhere to technical, operational, and security requirements. It integrates key components like the Gaia-X Registry, Compliance Service, and Notarization Service to manage and validate participants. GXDCH also supports trust and identity management by integrating with conformance bodies and identity verification services such as eIDAS. Any qualified service provider can operate a GXDCH node, promoting wide adoption and consistency in compliance data across the network (Gaia-X Association 2024d, 2024e).

Metadata Broker and Federated Catalogues

The feature of metadata broker and federated catalogues acts as mediator between data providers and data consumers and therefore as a sort of data source registry. It enables the provider to publish data, the data consumers to search and find data, and both of them to make agreements on the provision and use of data (Pettenpohl et al. 2022:33). In contrast, the

federated catalogue by GXFS, which is now maintained as XFSC (Cross Federation Services Components) by the Eclipse Foundation, is a decentralized feature that aggregates and indexes metadata from multiple sources, enabling a unified view of available data and services across different Gaia-X compliant providers (Gaia-X Association 2024b; GXFS 2024). While both serve to facilitate metadata management and discovery, the metadata broker typically operates within a more centralized governance framework, whereas the federated catalogue supports a federated and decentralized approach.

App Store and Operating Companies

As data spaces have the primary goal of enabling business ecosystems and their practical applications based on data, the app store is described as a key component of data spaces, in which participants may develop software and make this available in the trustworthy ecosystem of the respective data space. This store includes the payment and rating of such applications and services (Pettenpohl et al. 2022:34). In practice such app stores are realized by operating companies – an example is Cofinity-X, the first operating company of the automotive data space Catena-X (Cofinity-X 2024).

Vocabulary Provider

Data from different systems also is related to different natural and computational languages. In order to ensure efficient use, the vocabularies must be compatible and semantic interoperability must be established. This applies to ontologies, reference data models, and metadata elements. The feature description by Pettenpohl et al. still refers to central repositories, while collaborative approaches to data standards are gaining acceptance in the Catena-X example (Catena-X. 2024; Henn and Boss 2022; Pettenpohl et al. 2022:34).

Many assets and knowledge publicly available

As indicated above, the components listed are the core functionalities for a data space. This is just a small selection of technological components. Various organizations (such as IDSA, Gaia-X, the DSSC, BDVA, FIWARE, and the European and national Lighthouse projects) have created a variety of OSS and documents on building blocks, governance, business values, etc. over the years, which are publicly available. These assets can serve as a first point of contact for stakeholders who want to implement data spaces.

2.3.2. Current Use Cases and Impact

As is shown in the list of all current data space projects, the use case fields are heavily concentrated in the area of industry and less in socially oriented fields of application such as health or education – especially the mature projects (See Appendix 1). In the Springer publication ‘Designing Data Spaces’ from 2022, industrial data spaces were presented as one of many potential fields, although it should be noted that logistics and energy are also highly relevant for industry and therefore also contribute to industrial added value (Otto, ten Hompel, and Wrobel 2022:263–361). This could also be due to the fact that supply chain management and logistics are expected to be ‘the’ crucial domain in the B2B competition of the so-called *Silicon Economy*, where the assumption is that all logistics processes will be managed via AI by the end of the 2020s (ten Hompel and Schmidt 2022:263).

Many of the previously considered use cases could be perceived as a reaction to different legislations that demand more transparency and greater security and sovereignty for European companies when handling data (Data Governance Act, Data Act, AI Act, Corporate Sustainability Reporting Directive, Sustainable Finance Disclosure Regulation, Eco-design for Sustainable Products Regulation, etc.). However, there are still few publicly available results that would indicate any provable impact, although many companies present the claim of there being positive impact as unquestionable – interestingly this is especially the case for digital hegemony like AWS and non-profit organizations and researchers (Gasseling and Heini 2024; Green Data Hub 2024; Hoppe et al. 2023). From a Marxist perspective, this could be a critical issue because the claims about data spaces impacting sustainability could be seen as capitalist strategies to legitimize their dominance and deflect attention from systemic exploitation. Simultaneously, researchers may unintentionally support this capitalist agenda by legitimizing the control of digital hegemony and diverting focus from structural inequalities. There could be a potential risk of perpetuating exploitation and reinforcing existing power dynamics and needs to be proactively mitigated by participatory approaches of societal stakeholders and end users.

As part of the expert interviews in Chapter 3, African experts were asked about their assessment of the most necessary domains for data spaces for local benefits in West Africa in order to identify relevant fields of application for the future and to draw attention to outstanding hurdles in these domains. Because dataspace primarily originated in European circles, most of the active participants are also to be found in Europe – so there is currently no evidence that data spaces have a positive impact in accordance with the local needs of West African stakeholders.

Meanwhile, both projects (such as Catena-X) and standardization organizations (IDSA, Gaia-X, DSBA, etc.) are striving for internationalization – “*because data knows no borders*”. These are primarily directed towards the West (US) and East (Asia), and there is currently hardly any African participation (only two iHubs in Morocco and Tunisia on the part of FIWARE, which is part of the DSBA, but there are no data spaces implemented) (DSBA 2022:11).

A significant positive impact could be that the code of data spaces is primarily open source and can therefore be used and adapted by a wide variety of players worldwide for their use cases. In industrial production, 50 percent of software is already developed as open source (ten Hompel and Schmidt 2022:266). In any case, secure communications and data spaces are key to retaining data sovereignty (ten Hompel and Schmidt 2022:277). However, data sovereignty alone may not be sufficient for this, as infrastructure, internet, computing resources, education and R&D must also be sovereign – all of which must be embedded in political sovereignty and economic independence, as well as competitiveness and international (fair) cooperation.

In CIPE logic, the narrative of this Silicon Economy should be critically perceived as it highlights the unchallenged pursuit of digitalization, reflecting techno-solutionism that prioritizes technological advancement over addressing deeper socio-economic inequalities. The emphasis on data and infrastructure sovereignty underscores the need for African stakeholders to achieve technological and economic independence, yet it also implies a dependency on the global market's dictates. This focus on digital solutions risks perpetuating existing power dynamics and inequalities rather than addressing the root causes of exploitation and underdevelopment.

2.3.3. Gaps and shortcomings

Data spaces certainly offer numerous potentials, especially at the data level. However, these cannot be seen as a holistic approach for emancipatory potentials, as data sovereignty alone does not solve general sovereignty and access problems. Technological sovereignty, for example, has several levels that are not covered by data space technologies.

On a technological level, several aspects need to be noted: First, only the data exchange is sovereign, not the data usage. This means that transparency regarding its use theoretically ends with the processing of the shared dataset. This is particularly problematic because the technology creates only technical contracts. These technical contracts do not replace organizational agreements or legal contracts. Therefore, these must be negotiated separately

(Duisberg 2022:63; IDSA 2023d). The IDSA has developed sample contracts for different data transactions and according to the DSSC, all the agreements are legally enforceable (DSSC 2024; Duisberg 2022:83–85). However, misuse must first be suspected in order to uncover it, and even then, it may no longer be possible to trace it. Audit restrictions between the companies may even preclude such an investigation.

Further technologies and mechanisms, such as blockchain-based smart contracts, trusted execution environments, and other data usage control technologies, are needed to actually monitor data usage. Nevertheless, many of these solutions are in turn provided by large tech companies, which would limit the emancipatory effects on the global dependencies of data capitalists and could even reinforce them.

Data spaces require a *“common understanding of a legal point of view”* and *“must support trust, interoperability, portability of data and data sovereignty and must be non-discriminatory”* (Otto 2022b:7ff). However, this cannot be verified or demanded at the present time without extensive effort regarding legal contracts and their monitoring. Another option could be the compute-to-data approach, which allows data processing where the data resides rather than moving the data to a processing location. However, currently there is no public documentation on this concept used in data spaces.

In addition, little information about the impacts of data spaces have been publicly documented so far, even though the technology has been promoted by various initiatives for nearly ten years and substantial amounts of funding and investments have been funneled into these projects. This may be due to the fact that the adoption of new technologies, which is necessary for measurable impacts, can take several years. Nevertheless, impact assessments would be an important step towards the evaluation of the feasibility of global scaling and the adoption of the technology in other regions of the world, as well as necessary to learn from existing knowledge on implemented approaches.

In the context of the aspects listed above, a critical conclusion could be that although data spaces are well thought out in terms of their basic logic and can bring added value at data level, they could be too short-sighted and too weakly embedded in other sovereignty spheres for true emancipatory effects. Other aspects of technological sovereignty should be considered and

realized (e.g. edge computing, sovereign infrastructure, etc.) and sovereign processing must be ensured, which should be developed by local companies and not obtained from hyperscalers.

Nevertheless, great potential can be seen for ECOWAS stakeholders in the context of traceability, availability of data, contracting mechanisms, and verification of partners, services and sources. A significant advantage is also that much of the foundational code is open source, allowing African stakeholders to create similar ecosystems under their own conditions and thereby they can implement locally relevant use cases.

3. Methodology

The methodological approach used in the work was structured in five major parts and classified as a case study: (1) Theoretical Context and Literature Review. This included on the one hand the historical backgrounds of data capitalism and data colonialism; identifying and considering the power relations and hegemonies tied to those. A discussion of the results is presented in chapter 2.1. and 2.2., with a focus on the effects of neoliberal capitalism and uneven development associated with technology, leading to the status quo of today. On the other hand, in chapter 2.3, an elaboration is provided on data spaces as a tool to obtain data sovereignty and which potentials and shortcomings this could have. (2) Six semi-structured focus interviews were conducted with experts from different key areas, like research, business, legal, international relations, and data spaces. An overview of the experts and their expertise can be found in Appendix 2. (3) An iterative approach was taken for a thematic analysis via coding and categorization of the interviews held, thereby contextualizing the results of all interviewees with the theoretical background. (4) As a final step, conclusions were drawn based on the results of the analysis and its broader context with the theoretical framework and the literature review. An evaluation of the research results and a formulation of the remaining gaps for further research is also provided (see chapter 4).

3.1. Research Design

This thesis consists of two major parts, thereby constituting a case study: The first part was focused on the historical and theoretical contextualization of the topic in order to build up a broad, critical understanding of historical legacies and to be able to relate the relevant aspects to each other. This literature review was used to build the first hypotheses on the sub questions *“which geopolitical and economic factors led to the phenomenon of data colonialism?”* and

“how could data spaces be a countermeasure to it?”. In the empiric part, data and opinions were gathered from renown experts on digital development in Africa and data spaces.

The case considered in this master’s thesis is currently still a partly hypothetical case, as there is currently no publicly available evidence of an implemented data space in the ECOWAS region.¹ According to Gary Thomas’ typology of the *subject* for case studies (Thomas 2021a:110–25), the considered case in this study is an outlier case, since data spaces are generally positioned as a “*European invention*” and the theoretical part of the work for this thesis showed that African data spaces would entail specific factors (e.g. different legal frameworks, different driving stakeholders and their interests, different basic technological conditions).

The *purpose* of this case study is *instrumental* (Thomas 2021a:128ff), this study serves more than one purpose: initially, it should enlarge the author’s knowledge on how data spaces can be implemented in order to achieve emancipatory potentials in West Africa; but more importantly, it should function as an incentive for local stakeholders to identify potential benefits for self-determined value creation via sovereign data sharing technologies (data spaces) in the bigger context of fairer participation in global markets. After performing this research, the obtained historical understanding of data colonialism/extractivism (context) should be enough to interpret the empirical data gathered, and if data spaces could be a potential countermeasure to it. This case study is also *evaluative* (Thomas p129-131) because it was desired to investigate how data spaces in ECOWAS could be useful for self-determined economic possibilities, counterbalancing dependencies on global digital hegemons. Even though it may be argued that data spaces have not been established enough for an evaluative study (Thomas 2021a:129), and there might be little measurable evidence on their effects in reality, a choice was still made to take this approach, as this part of the research was about the still hypothetical case of data spaces being implemented in ECOWAS. Therefore, it is more about the evaluation of an opportunity. Within the work for this thesis an attempt was not made to form new theories, or to test or falsify current theories, but rather a reflection was made about existing theories towards local possibilities in ECOWAS.

¹ There is a website placeholder for an African Health Data Space, displaying in its description the wording “will help”, which indicates that this data space has not yet been implemented. There are no contact details on the current website, only the option to sign up for the newsletter. It is also not specified, whether this data space would be pan-African or primarily focused on a specific region.
<https://www.africanhealthdataspace.org/>

3.2. Data Collection

To effectively conduct the expert interviews for this case study, clearly defined research goals first produced (which was the critical extension of the understanding of subject matter and reflat hypotheses) and the appropriate experts to interview were selected (experts on digital transformation in Africa as well as experts on data spaces). A semi-structured format was chosen to guide the conversation, by clustering the topics relevant to the respective experts, as deduced from the theoretical part (Thomas 2021b:206). The three major topic fields for the questions of the interviews with African experts were: Historical context on dependencies and challenges of African dependencies, potentials of data-driven technologies (particular data spaces) in West Africa, and emancipatory potentials and local needs. In the course of the interviews, they were flexibly adapted to the input provided by the experts. For the data space experts, the first question was adapted to the context and backgrounds of data spaces and focus in the second question was more on the participation of African stakeholders in the current developments of data spaces. The third question was raised in a similar manner, with focus on emancipatory potentials of data spaces in West Africa.

The purpose of the interviews was to provide an outline of the hypothetical case, i.e. using and implementing data space technology in West Africa, enabling the drawing of an overall conclusion as well as recommendations for local stakeholders.

3.3. Data Analysis and Interpretation

For the qualitative part, a thematic analysis was performed in five major parts (deducted and adopted from Braun and Clarke 2022:16–23):

- Familiarization (as part of theoretical context and literature review; as well as familiarization with the interview transcripts per se),
- Theme development,
- Coding,
- Interpretation, and
- Integration into the context of literature review.

For the purpose of validating identified patterns of structures of data colonialism, intertwining with data-driven technology implementation and potential emancipatory approaches to counterfeit these structures, a deductive theory-driven approach was chosen for this thematic analysis (Braun and Clarke 2022:12).

Theme development

Based on the three categories of questions deducted from the theoretical part, the major three themes reflected in the interviews were (1) dependencies and sovereignty, (2) data spaces as a mitigating factor, and (3) emancipatory potentials.

1. Dependencies and sovereignty

This primarily includes the definition and perception of the term data colonialism, challenges of the data economy in West Africa, challenges related to data sovereignty, and the role of foreign stakeholders.

2. Data spaces as a mitigating factor

On this topic, the different experts shared their position of awareness and adoption of digital and data-driven technologies, with a focus on data spaces. The local needs and infrastructural challenges, as well as governance and policy frameworks are part of this category.

3. Emancipatory potentials and their requirements

This theme is related to the position of the experts on potential benefits and the respectively most relevant sectors (health, agriculture, finance, etc.), the role and importance of regional, pan-African and global cooperation (ECOWAS, AU, international collaborations), as well as specific stakeholder involvement.

Coding

In terms of manageability within the scope of the work for this master's thesis, it was decided to elaborate on strongly condensed list of codes. During the process a fourth code was added to Emancipatory Potentials in the course of the analysis, which summarizes general contextual challenges – as those mentioned by the experts did not properly fit in any of the existing codes. Moreover, the code DS01 was distinguished between African and European sectors for data space use cases. The codes were:

1. Dependencies and sovereignty

- a. DES01: External control over data and dominance in the technological landscape (e.g. reliance on AWS or Microsoft Azure for storage, distorting development efforts into a capitalist money-making machinery)

- b. DES02: Instances of data extraction by foreign companies for their economic benefits (e.g. app usage)
- c. DES03: Perception of data colonialism (e.g. “lack of sovereignty” instead of “data colonialism”) and sovereignty (importance of sovereignty and sovereignty ensured by technology)

2. Data spaces as mitigating factor

- a. DS01EU: References to data spaces being implemented in specific sectors in the European Context (automotive, mobility, etc.)
- b. DS01AU: Mentioning of sectors that could benefit from data space technology in Africa (health, agriculture, cross-domain, etc.)
- c. DS02: Challenges in setting up data spaces (e.g. infrastructure, governance, trust, etc.)
- d. DS03: Government strategies and policies related to data

3. Emancipatory potentials and their necessary requirements

- a. EP01: Benefits of data spaces generally and due to improving local conditions (e.g. improvement of health services)
- b. EP02: Importance of regional, continental, and global collaboration for success (e.g. ECOWAS, pan-African)
- c. EP03: Inclusion and education of local stakeholders (e.g. educating citizens on data sharing, including researchers and evaluators in the discourses, and enable exchange between different stakeholder groups)
- d. EP04: Challenges and recommendations with regard to the harvesting of emancipatory potentials

From a purely quantitative perspective on the codes, there was a strong focus on emancipatory potential and the related challenges from the experts during the interviews, which can be attributed to the fact that this was the major focus topic of the interview. The three code groups showed the following number of mentions:

- Emancipatory potentials: 103 mentions,
- Data spaces as mitigating factor: 76 mentions, and
- Dependencies and sovereignty: 55 mentions.

Among the emancipatory potentials, regional collaboration had the highest number of mentions (40 in total), followed by the inclusion and education of local stakeholders (24 mentions), and challenges for emancipatory potentials (24 mentions). From this it can be deduced that, that regional, continental, and global collaboration is a critical factor for realizing emancipatory potentials in the context of data capitalism. It indicates that the success of initiatives, particularly of those related to data or technological sovereignty, depends on the collaboration between different regions and entities – and this on many levels: intra-national (stakeholders from different domains and fields), regional (ECOWAS), continental (pan-African), and global (in the sense of exchange and mutual learning). Complex challenges like data sovereignty, technological development, and equitable access cannot be tackled in isolation and require fair efforts across borders that bring win-win situations for all involved parties.

The relatively high number of mentions of inclusion and education suggests that involving local communities and stakeholders from the beginning of the process is decisive for whether the project or initiative will be effective (not only efficient!) in the long run. This reflects an awareness that successful implementation of data spaces or other technological initiatives requires the active participation of those who are most affected by these developments (end users, citizens, etc.). The equal number of mentions for challenges indicates that the general strong recognition of the opportunities offered by digital technologies like data spaces is overshadowed by the challenges that are realities in West Africa (like infrastructure, energy, policies, etc.) and complicate the realization of such projects.

The higher number of mentions of DS01AU (mentioning of sectors that could benefit from data space technology in Africa, 12) compared to DS01EU (references to data spaces being implemented in specific sectors in the European context, 10) can be partly attributed to specific focus questions on these themes for all interviewees and the fact that African interviewees were not asked about European data spaces domains. However, it could also indicate that the topic of applying data technology in Africa in specific sectors is seen as relevant and urgent. It could reflect the situation that there is a strong interest in how Africa can benefit from the development and implementation of data spaces (and other data-driven technologies), especially in health, agriculture, and finance. This could also convey a sentiment highlighting the need for Africa to actively participate in the digital transformation across all spheres of politics, economy, and society, and to be actively involved in the development and use of

modern technologies, like data spaces, for different societal (better health), economic (stronger and fairer participation), and political (anti-corruption) benefits.

As the focus of the interviews was just partly on historical reasons for dependencies, these codes show lower numbers. In relation to the other topics, there was less focus on historical reasons for dependency. Nevertheless, DES02 and DES03 were equally mentioned, slightly more than DES01, which could suggest that concerns (of the experts interviewed) about data extraction by foreign companies and the broader ideological framing of sovereignty are more prominent in the discussions compared to the concerns about external control and technological dominance (e.g. local authorities using data storage capacity from hyperscalers).

Due to the research question *“Which geopolitical and economic factors led to the phenomenon of data colonialism and how data spaces could be a countermeasure to it?”*, the interviews were more focused on the second part and therefore logically more insights were provided on these aspects. From the data gathered and analyzed, it could be concluded about the first part of the research question, that data colonialism is a reality (whether that specific term is used or not) and is driven by a combination of technological dependence on foreign companies, economic exploitation through data extraction, and the broader geopolitical narrative of sovereignty loss. These factors are intertwined with the dominance of digital hegemons in West Africa, especially when it comes to infrastructure. With regard to the second part, it was assumed based on the data gathered, that data spaces can be part of the potential solution to the challenges posed by data colonialism. By enhancing control over the data of African citizen, companies and governments, data spaces can help ensure that (mainly economic) benefits of data use are retained within the region. However, the success of data spaces as a countermeasure depends on overcoming significant challenges in infrastructure, governance, and policies.

4. Conclusion and Outlook

Overall, the expert perspectives contributed a wide range of viewpoints to the research findings, with certain similarities in the expert responses depending on some commonalities in their field of work or regionality. A particularly critical perspective was offered by a development and evaluation expert, who has worked with ICT technologies in Africa since the early 2000s. Both the African experts and data space experts recognized the relevance of the topic.

4.1. Conclusion

With regard to the first part of the research questions “*Which geopolitical and economic factors led to the phenomenon of data colonialism [...]*” the following was concluded:

Data colonialism is a controversial term, both in literature and among the interviewed experts. However, its use is primarily intended to point to similar logic and basic components that it shares in the roots of historical colonialism. Historical colonialism is linked to capitalist development. Data capitalism is a new form of capitalism and entails consequences with colonial structures. This process represents a logical, parasitic continuation of the capitalistic imperative, creating new forms of dependencies and inequalities. Even if this form of exploitation is non-violent, it is nevertheless intensifying global power relations that continue to be dominated by stakeholders from the Global North (former colonial powers and new global players such as China). Florence Etta, an international development expert, has described this as a problematic development, because the reduction to one global ideology (capitalism) cannot be sufficient for the diversity of the globe (cf. Appendix 3, p. 25, line 796-801):

“Now capitalism became the only economic ideology of the world. So even the stalwarts that were opposing it, now joined the bandwagon. China, Russia... So now the whole world is singing the capitalist song. [...] We have to do something. The world is made up of more than one culture.”

The accumulation imperative is a central dynamic of capitalism, and the capitalist system always needs new markets and assets for its continued existence. In data capitalism, quantity is the new quality, and our quantified behavior is a permanent source, an ever-growing asset for reinvestment for data capitalists. This means that in this form of capitalism, people are constantly supplying new resources – most of the time unconsciously and for free (cf. chapter 2.1., 17, 22). As Etta put it during the interview: Technology companies are “*ripping us off*” with free applications via which we provide the data. “*It’s a bit like an iceberg. All we can see is the top. And they are the divers. And they are milking the bottom. But how many of us can be experts to understand what looks on the surface like a good thing?*” (cf. Appendix 3, p. S. 24, line 763-768).

Even if the concept of class may be overstrained, class tendencies in the sense of structural power and value creation are evident (cf. chapter 2.1.2.). The example given by Etta of the sale of kiondos (bags originating in Kenyan culture) underlines the capitalist skimming of added value through global online sales – controlled by non-Kenyans – with minimal benefit for the

actual producers (cf. chapter 2.2.1. and Appendix 3, p. 26, line 842-859). In this example, even more drastic consequences resulted from the original “helper narrative”: through the globalization of kiondos, they were produced in diverse locations worldwide, sometimes particularly cheaply, thereby destroying the local East African market and robbing cultural assets of indigenous knowledge of Kenyan citizens (cf. Appendix 3, p. 27, line 865-867). A similar dynamic of market obstruction can be seen in data storage and applications. Storage capacities from Amazon, Microsoft or other powerful providers are cheaper than storage in West African data centers. Local alternatives therefore have little chance of establishing themselves on the market – both with public and private customers (cf. Appendix 3, p. 13, line 405-407; p. 32, line 1057-1059). These technology giants are often supported by governments, influenced by the strong lobby of these companies (cf. chapter 2.1.2.). This shows the effects of unfair market conditions that arise from the historically determined inequality of productive forces – which are necessary for participation in data capitalism. This imbalance is also evident in the framework conditions such as infrastructure, legislation and enforcement, and the necessary skills.

Geopolitical Factors

The Scramble for Africa transformed the global balance of power. Since the end of the global East-West dichotomy, these dynamics have continued in the context of the New Scramble for Africa. Power structures have shifted, establishing several new hegemonic centers. These are not only states, but also transnational corporations exert a stronger hegemonic influence than ever before. Different former colonial powers were strongly reluctant to support technological development in West Africa, in order to preserve economic and political dependencies and further secure their dominant position (cf. Chapter 2.2.1.). The Digital Scramble for Africa can therefore be seen as a specific continuation of the New Scramble for Africa, whereby various global powers are competing for influence in Africa, with data and digital technologies as central tools for this competition. These geopolitical interests reflect neocolonial structures that aim to control and exploit African nations and citizens (cf. chapter 2.2.1.). These neocolonial dynamics are often disguised as aid for necessary areas of development, such as telehealth, telecenters, school networks, etc. – making ICT and the services built on them “*the new frontier for development*” (cf. Appendix 3, p. 19, 620-623).

The increasing competition between the US and China – generally and especially in Africa – is a major driver of data colonialism. Both countries are striving to expand their geopolitical power in the “technology race”. In Africa, this is particularly evident through economic investments and political alliances. Prominent examples of this are the Chinese Belt and Road Initiative, the US AGOA or AFRICOM (cf. chapter 1.2. and 2.2.1.). China is increasingly seen as a “dependable ally”, additionally driven by anti-European and generally anti-Western sentiments in West Africa (cf. chapter 2.2.1). In light of these dynamics, the EU tries to position itself as a strong partner for Africa. First, at the level of EU-AU collaboration with infrastructure flagship projects such as Medusa, whereby the EIB has mobilized enormous funds to strengthen digital cooperation between the EU and Africa in the long term (cf. chapter 1.2. and 2.1.2.). However, individual nation states also show motivation for intensified cooperation. One example is Germany since its G7 most recent presidency (cf. chapter 2.2.3.).

The EU’s strategies for maintaining competitiveness on the global scale to reduce dependencies on hegemonic players, and the motivations to create a counterbalance to the Chinese Belt and Road Initiative – which, among many other Chinese activities in Africa, is criticized as neo-colonial – this reflects the attempts to establish soft power in different regions (cf. chapter 1.2, chapter 2.1.2., chapter 2.2.1. and 2.3.2.). However, although the EU, US, and Asia are strengthening their collaborations on data topics, especially data sovereignty along value chains. (cf. Appendix 3, p. 38, line 1557-1258; p. 40, line 1312-1316; p. 56, line 1864-1870; p. 63, line 2086-2088), these activities are attributed by the experts to the necessity of supply chain transparency in the globalized economy (cf. Appendix 3, p. 39, line 1284-1293). The motivation of all these activities is questionable, especially considering the statement of the data protection lawyer, Winnie Dongbou (cf. Appendix 3, p. 3ff, line 86-89): “[...] *Africa is really attracting those companies, those big companies [...] because of the lack of framework, and they know that they can have access to the data without any framework and use the data.*”

It should also be questioned if the African stakeholders in the data economy would accept conditional dependencies in order to be able to build for example AI solutions. Therefore, the need for a more stable legal data protection framework and incentives for a local data economy are crucial, as the statement by Seydina Ndiaye, a Senegalese expert in artificial intelligence, suggests (cf. Appendix 3, p. 1087-1091):

„[...] when you talk about sovereignty, it's problematic for our public data to be stored outside Senegal or West Africa. And when we talk about economic value too, [...] there is an impact. So, it's problematic in this way. But it's the business, you know, it's globalization of the economy. So, you should have some incentive and some legal framework to help the local economy to grow.”

Economic Factors

Even if in data capitalism the appropriation of core resources is no longer violent, but the provision of data often happens voluntarily and often unconsciously, because technology is “weaved into our lives”, as Shoshana Zuboff has stated, it is still appropriation (cf. chapter 2.1.1.). Instead of the appropriation of land, data capitalism primarily involves the appropriation of data and a skilled workforce (cf. Appendix 3, p. 15, line 458-470).

The production of surplus value, i.e. the absolute law of capitalist production, has been enormously accelerated by the fact that the production of data is permanently ongoing. (cf. chapter 2.1.2.) Just as “cheap” raw materials and “cheap” labor are required for capitalist extension, now “cheap” data are needed – which correlates to other production factors due to data’s specific material characteristics.

Data capitalists aggregate data by making their infrastructure or apps available. While apps such as Whatsapp primarily aggregate personal data, Amazon (aws) and Microsoft (Azure) are dominant players with their storage systems, even for government data (cf. Appendix 3, p. 32, line 1053-1060). For local stakeholders, this often can look like personal added value and goes hand in hand with the elimination of local competitors. It can therefore be concluded that society has become a continuous production site and that the dichotomy between production and circulation sphere is not as evident in data capitalism as it was in previous capitalistic forms (cf. chapter 2.1.2. and 2.2.). It should be noted that the IDDL makes other work – apart from the production of data – such as the gig economy, or the mining of raw materials for ICT products and the production of parts of technological products, severely underpaid or precarious – Christian Fuchs has even described this as modern slavery – available to the capitalists. This is often accompanied by a positivistic narrative (cf. chapter 2 and 2.1.2.). The endless cycle of increasing productivity has an impact, especially in the context of the climate crisis – the production of technological devices and the operation of systems is intensifying this immensely. “That’s the message that the climate change is telling us”, as Florence Etta states (cf. chapter 2.1.2.; Appendix 3, p. 25, line 804-805).

Use value as the actual substance of capitalist value incentivizes companies to use data for different purposes. This requires specific knowledge and skills. Participants in the data economy need to have profound knowledge on when to collect data, how to process it, and what benefits that can be provided. In West Africa, data collection currently takes place primarily via applications from foreign stakeholders or retrospective data collection via surveys, which means that Africans often do not even have access to their own economic data and rely on external data sources (cf. 2.3.1. and Appendix 3, p. 33, line 1008-1016, 1023-205).

From a market economy angle, there are different perspectives on the regional differences of data value. In terms of behavioral surplus, the narrative that the data of a West African are not as valuable as those of a European could be considered plausible due to differences in purchasing power and therefore the worth of the data via marketing can be lower (cf. chapter 2.1.2. and 2.2. 23, 43; Appendix 3, p. 45, 1477-1482). Nevertheless, everyone using applications or online services performs “data labor”, which remains mostly uncompensated (cf. chapter 2.1.2.). Moreover, in a broader, macro-economic view the capitalist accumulation imperative constantly needs new markets and resources. In this logic, West Africa could be seen as a relatively new market for data capitalism (cf. chapter 2.1.2., Annex 3, p. 32, 1053-1060).

Considering market growth and macroeconomic performance, Africa is the second-fastest growing economy after India, making data from economic stakeholders in Africa specifically relevant. These market conditions and future prognoses further intensify the *New Digital Scramble for Africa*, for which African states do not have sufficiently established protection laws (cf. chapter 2.2.1.). There is also a lack of enforcement mechanisms of existing data protection laws in specific West African States (cf. chapter 2.2.; Appendix 3, p. 4, 104-107; p. 15, line 477-483; p. 17, line 546-548), as the statement of Winnie Dongbou underlines (Appendix 3, p. 10, line 301-304): “*Because for the moment, we only had the Convention on Cybersecurity and Data Protection. So, it’s the only instrument that we have at the African Union level. And it’s not even mandatory. It’s just a state[ment] to make some effort and to have data protection laws.*”

Overall reflection on the status and consequences of data colonialism

Data itself has its roots in historical colonialism, as information about local populations was accumulated for a variety of purposes. This data was often alienated from its original context of use for the benefit of the colonizers (cf. chapter 2.2.).

As the term data colonialism may be controversial because it does not show the same forms of violence as historical colonialism, the use of the more neutral version of data extractivism has its legitimacy. Whatever this phenomenon would be named, the expropriation of core resources is taking place and new forms of conquest are emerging. While the religious conquest was dominant in colonial times, we are currently observing a technology conquest. Overall, the situation described by Couldry and Meijas as data colonialism can be interpreted as a reality (cf. chapter 2.2.). Considering the existing power imbalances and structural inequalities, it may be crucial for West Africa to engage with the emerging paradigm of data capitalism for fairer market conditions. However, there are still some massive hurdles to this, such as the digital divide. Even though the discussion of the digital divide has now shifted from plain access to digital technologies, digital participation in many ECOWAS member states fails exactly because of this essential problem. The interviews and local status reports show that all three levels (access, skills, and low translation into socio-economic benefit) are a problem in West Africa (cf. chapter 2.2.1. and 2.3.1). Many initiatives to mitigate these effects were simply not successful. (cf. chapter 2.2.1), such as AISI's attempts to integrate Africa more the into information economy, which could – until now – be considered as being not successful. This may be due the insufficient consideration of broader (political and societal) contexts. Often good intentions, which are many times linked to development goals, are turned into a “money making machine” for the already powerful (see reference story on telecommunications providers in Africa in the interview with Florence Etta). In many cases, even regulations such as WATRA in the telco context do not create sufficient effectiveness (cf. chapter 2.2.1).

The result of the dynamics described above is that large technology companies dominate the world. This dominance means that there is no democratic environment on the Internet and technologies based on it, resulting in ideologies that ignore the underlying power structures and promote exploitation in diverse ways (cf. chapter 2.2.3.). In the narratives around digital development for social impact, this anti-democratic nature of the internet is often euphemized, and digital tools are presented as promoting democracy, even though the applications used to democratize discourses are in the hands of powerful corporations who profit from them.

Moreover, there is also a lot of manipulation, propaganda, and misinformation channeled via these prominent platforms (cf. chapter 2.3.1.).

Another detrimental consequence of the structural power of hegemons is a local skill shortage. In light of the logic that workers act as sellers of their labor, it is comprehensible that young, well-educated workers sell their labor to hegemons because they offer radically better (financial) conditions (cf. p. chapter 2.1.2 and chapter 2.3.; Appendix 3, p. 14, line 447-453; p. 15, line 458-470). This reflects the potential impact of technology adoption that individual benefits can lead to group inequalities and broader economic and societal changes at larger scale (cf. chapter 2.1.2.).

The dependence on external players in terms of infrastructure and skills can be even more drastic, as the example of Mariano Blaya Andreu, Director of Delivery at IDSA, on the failure of the MPESA payment system in Kenya shows. An outage of the servers in Ratingen and the lack of local experts led to riots and killings (cf. Appendix 3, p. 59, line 1953-19459).

Emancipatory Potentials and their requirements

The second part of the research question on “*how data spaces could be a counter-measure to [data colonialism]*” demands a broader context regarding emancipatory potentials in data capitalism in general. As the diversification of global connections and IDDL shows, the entanglements are extremely complex. For this work data spaces were chosen as a central object of research, as they are intended to ensure sovereignty of data in the technological design and could thus prevent unwanted access to data. However, emancipatory potentials in data capitalism are much broader than just on the data level due to the complex factors involved. Self-determination in dealing with such technologies is particularly important, which is why the evaluation of technologies, the necessary policies and their enforcement, as well as relevant cooperation models should be developed by local stakeholders: local companies, citizens (who act as end users), local NGOs, and think tanks. However, it can also bring benefits to inform, exchange and collaborate on global best practice models of the data economy that do not neglect the protection of citizens – where it makes sense from a local perspective. Nevertheless, caution should be urged when including big hegemons, as the dynamics surrounding dataspace also show that these are trying to establish monopolies with such technologies and reduce the market for others (cf. Appendix 3, p. 18ff, line 590-596; p. 4ff, line 1397-1399).

It should also be considered that the “data advantage” that the hegemons have, promotes epistemic violence and thus reinforces the differences in the control of innovation impacts. Moreover, against the backdrop of historical and existing dependency relationships, it must be considered that there may be motivations regarding structural influence behind cooperations, which is why the suggestion of critical local adoption of international approaches has been posited in this work. For example, in the context of data spaces, the existing open-source software stack can be used as a basis for different use cases, which can be enriched by local developers with additional features that appear necessary or useful in the local context. In the same logic, certain features that are considered irrelevant in the local context should be omitted in order to avoid an unnecessary overhead (cf. chapter 2.2. and chapter 2.3.).

It is currently unclear whether dataspaces can mitigate or actually reinforce epistemic violence. In principle, data spaces democratize access to data, applications and markets and technically secured data sovereignty can prevent misuse of data (cf. chapter 2.2.; Appendix 3, p. 54ff, line 1798-1805). However, since capitalist economic ideology has been imposed on Africa without considering local contexts, there are many post- and neo-colonial obstacles to overcome to make this hypothetical democratization of data and technology usable for African stakeholders. Overcoming these obstacles requires a holistic structural transformation of the global economy. In this process, data spaces are a small wheel in a large machine (cf. chapter 2.2.1.; Appendix 3, p. 24ff, line 775-801)

It can now be debated whether data protection is a “luxury problem” for West African countries, because individual and national sovereignty should be at the forefront of developments. Roland Fadrany, Chief Operating Officer of Gaia-X, has emphasized that in regions with overburdened legal systems, basic legal issues such as access to fair trials and the protection of individual rights must be resolved as a priority before complex data issues can be addressed. He has emphasized that stable frameworks and the ability to enforce these rules are necessary to meaningfully participate in international data initiatives (cf. Appendix 3, p. 44ff, line 1453-1493). He therefore sees a *“long way to go for dataspaces in West Africa”*. However, he highlights that this region has been exploited by the global North over centuries and that *“data is now the last asset. I would be very, very careful about that”* (cf. Appendix 3, p. 44, line 1440-1443).

The perspective of African experts does not give the impression that data regulations would be considered a luxury problem, they suggest that the existing challenges should be tackled “*in parallel*” and that data sovereignty is a key factor, because “*if you don’t have your data sovereignty, you don’t have sovereignty. This is something obvious, we can talk about sovereignty for food, but data sovereignty for me is the most important*”, as Mamadou Djigo, a Senegalese digital development advisor, emphasized (cf. Annex 3, p. 5, line 124-136; p. 13, line 293-396). In addition, some ECOWAS member states already have data protection laws that appear solid on paper. However, they lack enforcement mechanisms. This also goes hand in hand with Fadrany’s point that legal security could be a stumbling stone for the realization of data spaces in West Africa. However, he points out that dataspaces can technically protect data instead of burdening the legal system, as this could be a major advantage despite inadequate legal systems (cf. chapter 2.2.; Appendix 3, p. 38, line 1263-1273; p. 45, line 1495-1504). Moreover, it should be mentioned that any approach towards data spaces should first be tested and evaluated via Proofs-of-Concept (PoCs) and pilots to see whether data spaces can fulfill the required functions in local contexts and whether the complexities of social realities are sufficiently represented, because from the results of this thesis it can be suggested to not follow an internet-centric or techno-solutionist approach (cf. chapter 2.1. and chapter 2.3.3.).

In theory, every technology can bring emancipatory opportunities, but the global dynamics in the overall context play a role, as Shoshana Zuboff has suggested. Therefore, the time to think about the design and consequences of technologies and to steer them in a direction that benefits society globally is now – as a society we cannot wait any longer to find and propose pro-social approaches. Otherwise, the opposite scenario of oppression and further inequality through technology will most likely occur. In West Africa, political instability could hinder the role out any emancipatory potentials. However, increased data sovereignty can have fundamentally positive effects on stability in the political context (cf. chapter 2.1., chapter 2.2.3.). Cybersecurity is an important topic in this context and data spaces can provide flexibility for the resilience of systems (cf. chapter 2.2.3 and chapter 2.3.1.; Appendix 3, p. 43, line 1418-1430; p. 56, line 1855-1859).

According to African experts, awareness of the economic potential in West Africa has increased since the Covid pandemic, it is considered a turning point (cf. Appendix 3, p. 3, 56-70). However, as Karl Marx noted, changing ideas alone is not enough, the material conditions must also change. So there needs to be fairer distribution, availability and affordability of technology

for local stakeholders in the ECOWAS region and attention to efficacy, not just efficiency (cf. chapter 2.1.2.; Appendix 3, p. 22, 703-708; p. 15ff, 488-492).

Data spaces show potential in this respect because they can create transparency about global supply chains as well as in public administration systems. For example, transparency measures for anti-corruption were mentioned by one of the African experts as essential for the effective management of such innovation projects. The data space expert highlighted data spaces as a transparency-creating tool for combating corruption (cf. Appendix 3, p. 16, 492; p.64, 2113-2122). This sounds very promising in theory, as does the example of Digital Product Passports, which could provide transparency to African stakeholders in global value chains about the prices and conditions at which the end products are sold on international markets. Moreover, transparency is certainly an important first step towards fairer value creation in a wide range of industries, but the question remains about which measures can be taken when exploitation is identified in these chains (cf. Appendix 3, p. 57ff, line 1898-1930).

As with many new technologies, there are still many unanswered questions about data spaces at the moment, which may also be due to the fact that the current status of these is considered to be in a too early stage to assess the impact. Mariano Blaya Andreu sees the status as *“the initial part of the innovation, [...] in the transition from early adopters to mainstream, [...] researchers to implementers”* (cf. Appendix 3, p. 57, line 1880-1892). In addition, because these technologies are not static, but are developed constantly, longitudinal studies and developmental evaluation are needed for this ongoing process. Florence Etta has emphasized that *“The framework is responsibility”*. She has pointed to the importance of co-equal and co-creative responsibility between the developers and the users (cf. Appendix 3, p. 28, line 908-921). In this approach, inclusion in the sense of involving citizens and end users, education on the potentials and risks of technologies and inclusion in the sense of the digital divide, i.e. easy use for older people, accessibility for people in rural areas, applications in local languages, etc., are decisive factors for fairer development of digital technologies. Inclusion and education are specifically important when the people act also as data providers, such as in a data space use case in agriculture or health (cf. chapter 2.3.1; Appendix 3, p. 9, line 288; p. 16, line 493-497; p. 18, line 566-569, line 577-582; p.19, line 601-605; p. 28, line 908-921; p. 35, line 1144-1145, 1151).

Colonialism has left its mark on the digital sphere - considering that English has been established as the lingua franca of technology. This creates barriers for French-speaking countries in West Africa, where English may only be spoken as a third or fourth language (cf. Appendix 3, p 61, 2028-2040). The need for linguistic inclusion should be taken further by integrating several local languages into the respective technologies. An example would be a digital tool that understands and speaks Hausa, Fulfude, Mandinka or Bambara, and could enable translations of any applications into these or other relevant languages. The semantic interoperability of the respective data would then also have to be ensured. This is an aspect that Emancipatory Technology Studies and local developers should strongly consider strongly (cf. Chapter 2.2.3.).

Alongside all these fundamentals, data activism can be seen as a necessity. This could be realized in different variants like task forces for fairer data usage, which also have a legitimate mandate towards decision-makers, or the development of local social networks countering the business of digital hegemons, or even local hardware productions. A lack of African hardware was identified as a specific deficit in the context of dependencies by Mamadou Djiogo. He explained that *“We don’t have companies that build computers like the MacBook I have currently or some smartphones. So in terms of technology hardware we are behind”* (cf. Appendix 3, p. 12, 379-384). In the past, several initiatives on an “African smartphone” were taken. An example is the Mara Phone, that did not survive the Corona crisis. Difficulties in market expansion and the cost advantages of the dominant market players were among the reasons. Nonetheless, such initiatives could, on the one hand, encourage the transfer of added value in production from African raw materials to local locations and, on the other hand, increase technological sovereignty (Made in Africa 2021). Apart from hardware issues, the formation of organizations like NOYB would make sense in order to support locals on data protection (cf. chapter 2.2.3.).

The focus on inclusion of marginalized groups and cultural diversity, and economic and technological localization remain critical success factors for emancipatory potentials in West Africa. “Liberate the disadvantaged” should be a guiding principle for technological development (cf. chapter 2.3.).

Twin transition potentials and impacts are questionable

Considering all the above-mentioned contexts, the twin transition seems to be a shaky narrative, because this approach has a large potential for exacerbating global inequalities in resource distribution. Many West African countries are very rich in raw materials required for ICT technologies, which entails a great risk of resource exploitation and massive environmental damage. Moreover, although technology adoption has been constantly increasing over the last few years, in the GII report it was shown that labor productivity had fallen to zero percent by 2022, and that no substantial reduction of CO2 levels can be expected in the near future. In addition, it remains open whether “*capitalist business as usual – but faster*” will facilitate any protection of the planet and create fairer relations between different regions (cf. chapter 1.1. and chapter 2.1.2.). In addition, globalized society tends to prioritize growth over the environment and influential international organizations promote free trade, boosted by profit-driven technological development. Current political institutions emphasize global competitiveness and geopolitical interests, while power remains concentrated among elites who strive to maintain their dominance (cf. chapter 2.1.2.).

The energy required to store data, to perform search queries or operate AI solutions is enormous. Therefore, in light of the infrastructural issues reflected in this paper, a fair inclusion of Africa in this twin transformation is unlikely to be expected. These concerns were also reflected in the interviews (cf. Appendix 3, p. 5, line 124-128, 130-132; p. 47, line 1540-1551) – even if certain countries might have lower hurdles in this respect, as AI expert Seydina Ndiaye pointed out (cf. Appendix 3, p. 34, 1097-1100).

Collaborative strategies for fairer global outcomes in data capitalism

The problems and challenges posed by data capitalism with all its exploitative tendencies cannot be solved by individual nation states alone. Regional (ECOWAS), pan-African and global cooperation is necessary to address the complexities. Different authors and the interviewed experts have recommended an AU-wide harmonization of initiatives, strategies, and laws. Different groups advocate for a pan-African approach to data, with corresponding institutions that can ensure appropriate enforcement of the different policies. Furthermore, it could be advisable to create pan-African tech value chains to strengthen market power in the global context through an intra-African partnership ecosystem. Participants of this ecosystem could strengthen each other via cooperation on the necessary funding, which could lead to stronger capabilities in the global economy. Winnie Dongbou considers the organization of the

EU as a good reference example, as funding comes from individual member states as well as the EU itself and joint commitments are made despite differing national interests. Reference frameworks, building blocks and lessons learned from projects for relevant domains, such as AgDataHub or Health-X Dataloft, should be considered (cf. chapter 2.2.; Appendix 3, p. 5, line 146-151; p. 6, line 172-177; p. 47ff, line 1559-1568; p. 64, line 2128-2138).

Some ECOWAS states are already very advanced in terms of data technologies (e.g. Ghana, Nigeria) and have already established initial touchpoints with data spaces (Senegal). It remains questionable whether sufficient mechanisms and enforcement tools are in place for these pioneers, but they can shape the local landscape. It is interesting to note that Senegal appears to be cooperating most intensively with the EU on such matters and at the same time receives the highest sums in loans from China (followed by Benin and Ivory Coast, all West African states and ECOWAS members) and China is Senegal's second largest partner (cf. chapter 2.2.1. and 2.3.1.; Appendix 3, p. 34, line 1109-1118; p. 35, line 1159-1167).

Interoperability is an important topic which needs to be considered in order to not isolate solutions to one single state. *“As people move, services will move”* which is why different regional systems need to be able to communicate with each other – Mamadou Djigo underlined this with a concrete example of moving between countries with a specific health condition. Interoperability enhances the availability of patient data for medical professionals to be able to assess the conditions more precisely and therefore provide better healthcare. This could be a suitable use case for dataspace implementation (cf. Appendix 3, p. 15, line 485-487; p. 17, line 534-546).

Although there are differing perspectives among experts on what the ECOWAS can ultimately achieve – whether it is capable of incentivizing or influencing member states; or whether it has limited power to act – the experts largely agree that it is time to act on data, data protection, security and sovereignty, and how to use data for good socio-economic impact. This is the case because in the radically rapid transition to data capitalism, society has failed to sufficiently protect digital rights (cf. Appendix 3, p. 9, line 256-259; p. 17ff, line 552-558; p. 54, line 1782-1799).

The EU, US, China and Japan are currently developing global cooperation models on data spaces, African stakeholders would be well advised to consider long-term visions for cross-continental collaboration for local benefits as well (cf. Appendix 3, p. 38, line 1257-1260; p. 56, line 1864-1870; p. 63, line 2086-2092). According to Florence Etta, fair cooperation reflects the African mentality, which supports a pan-African collaboration approach that leverages global cooperation – where possible meaningful and non-exploitative – in the long term: *“In Africa we say... Your destiny is tied to mine. That is how we are wired. [...] That’s the mentality and the value system that we have grown up in”* (cf. Appendix 3, p. 24ff, line 775-794).

Reflections on data spaces and their potential contributions to emancipatory potentials

Data spaces can only play a small role in the complex of emancipatory potential, because sovereignty has many more spheres. The political, economic and social sphere and the interaction between them is not detached from technology and the development of its effects. Nevertheless, the basic idea of data spaces shows some possibilities, even if the approach to creating a European cloud alternative to hyperscalers has changed. It is no longer a question of excluding hyperscalers completely, but rather of not letting them determine everything. The participation of hyperscalers can also help to accelerate the adoption of data spaces on a global scale – whereby it is crucial to ensure that these players do not build new monopolies around data space technologies (cf. chapter 2.3.; Appendix 3, p. 42ff, line 1398-1399; pp. 62, line 2049-2055). What data spaces definitely can be harnessed to do is to federate local databases and provide access to global databases for local solutions. This can empower West African companies and create fairer access to the global market. Data spaces could also be used to create transparency about supply chains and highlight exploitative behavior – although the question of resulting mitigation measures remains open. It is important that African actors determine and manage this part of the value chain and can demand local conditions. By participating in existing data spaces, African companies can find new partners and tap into new markets. West African solutions, for example, could be offered in app stores of respective data spaces. By creating African data spaces, local needs can be addressed, and social added value can be created (e.g. in the areas of health, agriculture, anti-corruption, finance, education and skills, etc.). What must be considered, however, is that the benefits of data spaces are not yet clear, even in the European context. This is because full adoption may still take several years and the technology needs to be enriched with important features and standards (such as the OpenID Connect standard). Currently, most and especially the most mature use cases are still related to

industrial contexts, challenges around the correct handling of personal data remains a topic to be clarified.

Overall, it is not advisable to apply copy-paste solutions – local approaches and adoptions of existing technology are needed for local benefits, although there is of course potential for reusing the OSS stack of data spaces. Along this journey, a constant evaluation of the impact, efficiency, and effectiveness for end users is needed.

Overall conclusion

Data colonialism is a logical consequence of capitalist development and brings with it much inequality and exploitation. Sovereignty is a crucial issue in this modern form of capitalism and should be addressed at all levels. Data sovereignty is only one sphere of many but is considered essential by local experts. Data spaces can only play a small role in the direction of emancipatory potential but are interdependent on the success of gaining sovereignty at the political, infrastructural, legal, governance and continental cooperation levels. Stronger policy frameworks and essential investments in education and infrastructure are needed so that the impact of data spaces can be unfolded.

It should be noted that all the emancipatory potentials that have been identified in connection with data spaces are intra-capitalist. In other words, they could only partly mitigate the consequences of the inequality that already exists and is fueled by capitalist logic. No anti-capitalist emancipation or potentials were identified with regard to fairer economic models, but this was also no specific goal of this thesis. It remains to be critically examined whether the increasing datafication in Africa fuels the accumulation imperative of data capitalists. Against this background, protection mechanisms for African citizens, companies, governments, and communities are even more essential.

In general, the capitalist ground for these developments remains problematic, because the world is too diverse for an ideology that is globally valid (cf. Annex 3, p. 24ff, line 792-801).

“Let it be the African century that shows the world, that taking and taking and taking for yourself and your people, and yours only, does not make you safe.”

Florence Etta (Annex 3, p. 25, line 803-804)

4.2. Contributions to Research Discourse

Even if the work for this master's thesis is only a first, reduced touchpoint within this complex of topics, and the scope this work does not fully do justice to it, some valuable contributions to the research discourse can be interpreted. No connections were found between CIPE and data spaces for this region in the course of the research. This resonates with a certain novelty in terms of applying the European concept of data spaces to the specific conditions and challenges of the ECOWAS region.

To analyze data spaces not only as merely technological innovation, but also as a potential means of emancipation and reduction of the dependencies on the international political economy also seems not to be a common approach. In the work for this thesis, the intention was to specifically emphasize the need for the development of data infrastructures and strategies in Africa to be steered by African actors in order to avoid neo-colonial dependencies. This reflects the approach of rejecting Eurocentric models and calling for greater independence and self-determination for the region in a specific light.

One of the biggest shortcomings of this work is that it did not sufficiently reflect the diversity of West Africa in this reduced framework. ECOWAS as a focus region is too broad for detailed analysis of this topic and a more comprehensive consideration requires more time and more space.

Apart from that, a larger corpus of interviews and citizen surveys would have been an important tool. Perspectives from the frequently mentioned regional actors (ECOWAS, African Union, national governments of West Africa), as well as global actors (governments of the big hegemons US, China and the hyperscalers), would have been valuable. Citizen surveys would have been particularly relevant for identifying local knowledge levels, the need for use cases, and requirements.

4.3. Outlines for Future Research

The work for this thesis can only be seen as a starting point for a variety of further research. It opens many doors for focus that have a broader context than work for a master's thesis.

The following further research areas and questions have been identified as being relevant:

- West African policy landscapes on data protection, cybersecurity, and inclusivity in technological development. Detailed research on existing policies and possible enforcements from a national, regional and continental perspective would be particularly exciting. This could be accompanied by a global comparison.
- How have attempts to integrate Africa more strongly into the current global economy “failed”? Have they failed or have they been able to achieve valuable impact? What are the lessons learned from initiatives such as AISI and Co.?
- What are the requirements for a pan-African collaboration on data, including necessary institutions and enforcement mechanisms?
- How can measures to revolutionize global value chains be designed once transparency on exploitation through data technology has been gained? A concrete use case here would be a digital product passport for Kiondos.
- Where is there a need to protect citizens’ data from local governments and not just from corporations or foreign governments?
- What funding opportunities are there that could support projects for infrastructure, education, technology development, and innovation without promoting dependencies?
- Specifically relevant for CIPE researchers could be a hypothetical comparison of intra-capitalist emancipation and anti-capitalist emancipation, leading to proposals for alternative economic logic.

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7. Appendices

Appendix 1: Overview Data Space Projects.

Appendix 2: Expert Profiles.

Appendix 3: Interview Transcripts (coded).