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BENEATH THE WAVES: OWNERSHIP AND CONTROL IN THE SUBMARINE CABLE INFRASTRUCTURE

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Introduction

Over the past century, the internet has seen massive data transfer and capacity developments fuelled by artificial intelligence, streaming, and social media progress. This growth has also significantly impacted the backbone infrastructure of the internet, which must support the rising data consumption driven by these technologies and the increasing number of users globally. A crucial component of this backbone infrastructure is the underwater cables that carry data between countries and continents beneath the ocean's surface. Submarine cables carry around 99% of worldwide internet traffic. However, it remains understudied in media and communication research, with only a handful of empirical studies focusing on an aging version of the submarine cable infrastructure (Starosielski, 2015; Winseck, 2017, 2019; Xie & Wang, 2023). This study contributes to a gap in the research, illuminating the contemporary state of ownership in the subsea cable infrastructure in 2025. Research in this area provides knowledge that can ground monitoring and ultimately regulate the intricate market of digital communication, explicitly around these critical data infrastructures that possess much more complicated properties and relations beyond their mere material composition.

Studying the structural arrangements of data infrastructure can contribute to political debate, monitoring, and regulation of the physical data infrastructures and the companies in control that shape our increasingly datafied society (Flensburg & Lai, 2024). A wide range of literature in infrastructure studies has focused on the sociocultural and relational aspects of infrastructures using qualitative and ethnographical methods (Flensburg & Lomborg, 2023). Recently, a subset of studies, predominantly originating in media and communication studies, have argued for also

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carrying out empirical macro studies reframing infrastructures as material structures that can be owned and controlled (Hesmondhalgh, 2021). Rather than focusing on case studies or sectors, macro studies of infrastructure emphasise how broader structural arrangements frame global data and communication flows (Flensburg & Lai, 2024; Hesmondhalgh, 2021).

This study seeks to understand this critical component of the broader data infrastructure: the global network of internet submarine cables. Based on a political economy approach and a material perspective in infrastructure studies, this study examines how the global infrastructure of underwater cables is owned and controlled, and how the power derived from this ownership has historically been manifested. Understanding ownership of data infrastructures first requires understanding how the infrastructure supports basic communicative tasks, i.e. what technologies are activated whenever a user communicates via the Internet (Flensburg & Lai, 2024).

Methods

The study employs digital methods to gather and process data about underwater cables from existing quantitative data repositories, mainly using web scraping scripts and APIs. Beyond data collection, this illustrates h*ow* industry stakeholders' existing data can answer questions about media industries, rather than generating new data through ethnographic or other qualitative methods (Jensen, 2012). To analyse the ownership structures, the study utilises traditional network analysis and visual network analysis to identify relationships between companies involved in the infrastructure and to uncover unclear connections in the data. Visual network analysis, a variation of network analysis, highlights the significance of positions, colours, and weights of entities and relationships when visualising networks, enabling a more comprehensive visual analysis of the project's large volume of relational data (Venturini et al., 2014).

Findings

The analysis concludes that for the past decades, a diverse group of companies has owned the global network of underwater cables, contributing to previous studies challenging the constructs of a US hegemony, i.e. the internet being dominated by mainly actors from the United States of America (Winseck, 2019). Many cables are owned by only one company; however, more than 25% of cables are owned by a cooperation between two or more companies, resulting in a network of co-ownership where some companies collaborate more with companies that mimic their own business model, historical origin, and geographical location. Beyond regional actors, historically, the market has been dominated by a smaller group of national legacy telecommunications companies originating in Europe, Asia and the US, closely connected to imperialism. Their market dominance, however, has weakened in the past two decades. In its place, American Tech giants like Google and Facebook have become the driving force behind the recent expansion, replacing the old cables laid by legacy telecommunication companies and replacing them with new cables in new contexts around the globe. This transfer of ownership is nothing new within the industry;

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nonetheless, this shift represents a change in the industry as they, through their other business ventures, can fund the implementation of large-scale infrastructure projects at a rate much more significant than other actors. Expanding into new geographical areas would enable them to grow their digital empire in new markets for their additional platforms. Without the necessary infrastructure to support their digital platforms, there is no viable business for these platforms. Enhancing the cable infrastructure in Africa or certain parts of Asia would help Google and Facebook attract more users and businesses to their platform ecosystem.

Discussion

This shift in ownership structure is further discussed in terms of how control over this infrastructure can provide a unique form of power that affects digital communication – infrastructural power (Mann, 1984). In communication research, political economy generally deals with a broader definition of power as the ability to control resources, people, and communication (Mosco, 2009). This conceptualisation has called for studying the companies that own the cables, their relations, and how they influence communication resources. However, there are arguably numerous differences between the power derived from owning media industries, such as publishing or TV networks and the power derived from owning the most fundamental material infrastructure responsible for almost all digital communication. It is discussed whether the knowledge derived from analysing the one-dimensional aspect of ownership of one part of the data infrastructure allows us to trace infrastructural power rather than providing a point of entry to studying it.

This study contributes to the broader literature on infrastructure studies, following the infrastructural turn in media and communication research (Hesmondhalgh, 2021) while also updating and complementing the limited empirical research on underwater cables. Investigating the ownership and control of communication infrastructure is the initial step in uncovering power relations within these systems. It is essential to focus on the larger context rather than solely on platform or traditional telecommunication companies to understand the wider implications of control and power in global infrastructure, which provides better opportunities for monitoring and regulating the systems we depend on for nearly all digital communication.

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