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THE GEOPOLITICS OF SUBSEA DATA CABLES

Subsea Communication Cables in Southeast Asia: A Comprehensive Approach Is Needed

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Contents

Summary

In 1859, the Dutch colonial administration attempted to link its East Indies capital, Batavia (now Jakarta) to the British entrepot of Singapore by way of an undersea cable. The project met with great difficulty and ultimately failure. In many ways, the venture was a product of its era, imperious in scope yet experimental in innovation. It rapaciously extracted from its surroundings and unsurprisingly came up against challenges from the very environment it sought to change.[1] Still, the Batavia-Singapore telegraphic line and its contemporaries persisted, paving the way for the global fiber-optic communication cables that we take for granted today.

This paper begins with an explanation of why subsea communication cables (hereafter cables) are important to Southeast Asia and how the region is a critical node in the World Wide Web of cables. The paper will then outline the natural and induced risks to cables, emphasizing the importance of resilience-proofing these fiber optic lines of communication. By pulling on the thread of cabling history in the region, this section argues that ecological lessons and trends from the nineteenth century onward remain pertinent for cable resilience, especially as Southeast Asia—and indeed, the world—grapples with an increasingly urgent climate emergency.

The paper's third section addresses the forces influencing cable decisions today. Interstate tensions and the competition for influence, conspicuous during the expansion of both empire and telegraphy, are resurgent as national security considerations tangle with commercial rationales for cable routing and supply. In the past, whoever ruled the waves ruled the world. Now, whoever controls technological infrastructure controls the future. This section argues that Southeast Asia's decisionmakers will need to view cables through more than just an economic lens. The paper concludes with recommendations for a more comprehensive approach to making cable-related decisions in Southeast Asia.

The Case for More (and More) Cables in Southeast Asia

Southeast Asia's strategic location amid major, surrounding waterways means that the region is an important node in the web of undersea cables linking the continents of Africa, Asia, Australia, Europe, and the Americas. In 2023 Singapore alone hosted twenty-six cable landings in three landing sites.[2] In fact, Singapore was first connected to the colonial British administration's other straits settlement, Penang (now a state in Malaysia), by telegraphic cable as early as 1870.[3] That line connected on to Madras (now Chennai in India) and was part of the British All Red Line telegraph network linking the empire's various colonies and territories around the globe.[4] By 2028, Singapore will be connected to over forty subsea cables and plans to double its number of landing sites in the next decade.[5]

Although internet penetration rates vary within and among Southeast Asian countries due to a range of factors from financial to topographical, demand for greater connectivity at faster speeds has been steadily climbing across the region. An interplay of government policy, industry innovation, and expanding consumer usage of data-driven technology over more than two decades explains this.

As the World Wide Web began to make its presence felt at the turn of the millennium, the then seven members of the Association of Southeast Asian Nations (ASEAN) recognized early on, albeit quite cautiously, the internet's prospects for the region's economic advancement.[6] Governments and corporations began investing in digital infrastructure, and the first modern cables connecting continents snaked their way through the ocean. In 1999, the nearly 40,000 kilometer long South East Asia–Middle East–Western Europe 3 (SEA-ME-WE 3) cable was a consortium venture that landed in over thirty countries and territories.[7] A few years later, the SEA-ME-WE 4 cable came online at half the length and number of landings. Major investments continued to be ploughed into subsequent upgrades of the SEA-ME-WE project for increased capacity.

In the Pacific Ocean, the Asia-America Gateway cable was built in 2009 to connect Southeast Asia to the west coast of the United States through Hong Kong, Guam, and Hawai'i. As a reflection of changing realities, the Asia Connect Cable, planned for 2027, will link Australia, Southeast Asia, and the United States through the Java Sea, avoiding the traditional route of the South China Sea along with its geopolitical hazards.

These numerous cables are expected to service the next wave of the digital age as countries anchor their growth and development strategies on data-driven technologies such as artificial intelligence and the Internet of Everything, as well as the infrastructure supporting them. In the past few years alone, Malaysia has attracted pledges of billions of investment dollars by Google, Microsoft, and Amazon for the construction of so-called cloud regions, where providers host data centers and other infrastructure to offer cloud services.[8] Indonesia, Thailand, and Vietnam are equally fast-growing data center hubs in Southeast Asia.[9] Many

of these data centers are located close to cable landing stations to reduce latency. But as edge computing—a technology that favors a distributed architecture and brings computing services as close to data sources as possible—trends upward, the changing structure of cable ownership will likely ripple through the region, as discussed later in this paper.

Further, population shifts to mobile-first data usage has meant that consumer demand has conveniently coincided with an explosion in industry supply of devices, platforms, and services. These include affordable smartphones, cloud storage, video streaming, and e-commerce sites. Super-apps, which offer multiple services on a single platform, became particularly expedient during the shutdowns of the coronavirus pandemic and have emerged as a dominant feature in Southeast Asia's digital landscape.

These developments, all of which look set to trend upward, require expanded bandwidth to cope with the already exponential surge in data volume. Since subsea communication cables account for over 99 percent of intercontinental data capacity and demand for them continues to rise despite the availability of satellites in low Earth orbit, the number and sophistication of cables traversing Southeast Asia will keep growing.[10]

As cables have gotten more technologically advanced, prices have steadily declined at an average compound annual growth rate of -17 percent.[11] Capacity, in the meantime, has trended the other way. The upgraded second iteration of the Southeast Asia-Japan cable (SJC2), still in the works, has a capacity of over four times that of the original SJC built in 2013 (144 compared to 28 terabits per second [Tbps]). Assuming continued demand as well as supply chain regularity, increased capacity could translate into lower bandwidth prices for enterprise and individual consumers. Yet, as will be seen in the following sections, evolving market dynamics and geopolitical factors could change the cable ecosystem in dramatic ways for the next few decades.

Risks and Resilience

Natural Risks

Southeast Asia's maritime geography, geological features, and underwater topography render cables in the region vulnerable to several natural and human-induced points of failure. These include seismic activity, theft, and accidental cable damage from shipping activity. The last of these is especially prevalent given that the region is home to some of the world's busiest shipping lanes in the world. The Strait of Malacca, which connects the Indian and Pacific Oceans in the shortest and, therefore, most economical way, has between 80,000 to 90,000 vessels sailing through every year.[12] With the South China Sea also seeing tens of thousands of fishing, container, naval, and other ships transiting annually, it is unsurprising that cables in the area—some of which are older—risk damage from anchor drags.

In general, many cables in the Asia-Pacific region laid in the early 2000s were buried in the seabed at a depth of 1 meter or less.[13] At the same time, larger and newer vessels deployed for deep-water fishing and a swell in fishing activity as the coronavirus pandemic died down have resulted in more frequent cable breaks as dropped anchors come into contact with and drag these cables below the seabed.

Vietnam, in particular, has had to manage multiple cable failures in the past two years. In February 2023, all five of the cables connecting the country to the world experienced partial or total damage, causing a 75 percent loss of the country's data flow over the Lunar New Year period.[14] Even though providers purchased an additional 3 Tbps worth of data flow over land cables to compensate for the loss, connections were still slow as data had to travel further through China. Repairs to the cables took between three to nine months, reinforcing Vietnam's need for greater cable redundancy.[15] This requirement was unfortunately underscored again in 2024 when three out of five cables connecting Vietnam—Intra Asia, Asia Pacific Gateway, and Asia-Africa-Europe-1, all of which had been damaged the past year—went down again. Although the causes of the disruption were unclear, previous failures were assumed to be cable degradation over time or ship damage.[16]

But nature is a formidable and humbling force. In the nineteenth century, following the failure of the Batavia-Singapore cable, Dutch colonial leaders turned to the Sunda Strait as an alternative cable route and attempted to connect the coastal town of Anyer, on the island of Java, to Teluk Bentung (now Bandar Lampung) on the island of Sumatera. Initial work and subsequent repairs on the line were repeatedly delayed by a host of events, including environmental ones beyond human control. These included the monsoon season in 1865, termites that bored through the insulation in 1873, heavy growth of coral that attached to the cable in 1876, naval shipworms (a species of saltwater clam) in 1879, and, finally, the massive volcanic eruption of Krakatoa caldera in 1883, which severed the cable and destroyed the locations at both ends. While telegraphic cables seem like a wondrous forerunner to worldwide connectivity and globalization, these incidents offer "a reminder that revolutionary progress does not always feel like that on the ground."[17]

Ecological constraints still figure in cable planning in and around Southeast Asia, especially for cables laid beyond the continental shelf of coastal states, where geohazards account for at least one-third of breaks.[18] With Indonesia and the Philippines located well within the Ring of Fire—a roughly horseshoe-shaped belt of seismic activity circumventing the Pacific Ocean—any major earthquake or volcanic eruption resulting in landslides or strong underwater sedimentation flows could result in damage to multiple cables.[19]

In December 2006, two magnitude-7 earthquakes occurred in quick succession off the coast of southwest Taiwan. The quakes and their aftershocks mobilized strong, dense sediment flows that resulted in over twenty breaks in eight cables in the Strait of Luzon between Taiwan and the Philippines. The breaks caused major communication failures across Asia including in Malaysia, Singapore, and Thailand. The diversion of data traffic to backup cables, where those were available, led to congestion in those links instead.[20]

Research on geohazards to cables suggests that submarine canyons are not ideal routes for cable laying.[21] For example, during the 2006 earthquakes, the Gaoping Submarine Canyon was the discharge point for debris from Taiwan's Gaoping River, before the seabed sloped further down to the Manila Trench in the Strait of Luzon. However, alternative sites may not always be possible: Rerouting cables through the Taiwan Strait would have run up against intense fishing activity there, while burying cables deeper in the seabed would have proven more costly.

What happens on the surface of the water also impacts the seabed. With typhoons gathering greater ferocity due to changes in climate patterns, the stability of continental shelves could shift due to more severe currents and waves. In 2009, Typhoon Morakot dumped over 3,000 millimeters of rainfall in four days over Taiwan and triggered heavy sediment flows from river floodwaters and storm waves in the adjacent continental shelf. Those flows damaged eight cables and crippled communication and connection speeds in the Asia Pacific, including in Malaysia, Singapore, and the Philippines.[22]

On land, subsea cables connect to terrestrial cables after surfacing into beach manholes. They can also bypass manholes to terminate directly at a landing station. In a climate-vulnerable region like Southeast Asia, coastal erosion and rising sea levels could present a challenge to maintaining the integrity of these landing points.[23] Even cable landing stations, which are often hardened concrete structures with perimeter fencing, surveillance, and backup generators, can succumb to the forces of nature if disasters impact the people operating those facilities or the power grids that electrify them.[24]

Induced Risks

Induced disturbances to the natural environment, such as sand dredging and deep-sea mining, could also adversely impact cables. Until recently, Singapore was one of the largest importers of sand in the world. It remains by far the biggest in Southeast Asia. Since the 1970s, it has expanded its land mass by some 20 percent by procuring sand dredged in and around Indonesia, Malaysia, Cambodia, and Vietnam.[25] The area of Tuas in the city-state, which has undergone repeated reclamation works over the past five decades to accommodate industrial development and port activities, will have nearly twenty fiber-optic cables linked to it by 2026. For Singapore, Tuas represents the confluence and transformative impact of what academic Luke Munn refers to as "sand and silica," the latter a nod to the core and cladding of optical fibers that make up modern-day cables.[26]

But the commercial exchanges of millions of tons of sand between Singapore and its neighbors have also "effectively denud[ed]" those states' natural protection against coastal erosion, biodiversity, and community life.[27] With Indonesia resuming sea sand exports this year after a twenty-year moratorium,[28] there are concerns that the mining of this natural resource—even if it would be of just sea sediment, as President Joko Widodo assured—will result in irreparable damage to the archipelago's coastlines or, worse, the complete disappearance of whole islands, as occurred between 2005 and 2010.[29]

Moreover, with Southeast Asian countries turning their eye to deep-sea mining, the geomorphology of surrounding land and seascapes will likely have direct and indirect repercussions on cable resilience in the region.

Red Tape, Rows, and Repairs

All these risks raise the question of how quickly cables can be repaired when damaged. The answer depends on several variables, including the availability of repair vessels and their crews, the distance from the fault to supply depots and repair ships, the weather, the conditions at sea, the regulatory requirements or restrictions, and the nature of repair contracts. Repairs conducted through the spot market, where cable repair vessels are sourced at short notice on the open market and potentially subjected to premium pricing, for example, can take priority over those done through a maintenance agreement, which sets a price for a specific period thus providing more predictability in terms of guaranteed services and rates.[30]

When the SEA-ME-WE 5 cable was damaged in April 2024 in Indonesian waters in the Strait of Malacca, administrative red tape and Jakarta's protectionist cabotage policy delayed repairs from approximately three days to several weeks.[31] The cable fault disrupted connectivity in Bangladesh, meaning that the South Asian country had to fall back on its only other subsea link, the SEA-ME-WE 4, and terrestrial fiber from India.

In June 2024, the Malaysian federal government decided to reinstate a cabotage exemption for foreign ships to install, maintain, and repair cables in the country's waters.[32] This came after significant pressure from local and international tech players, as well as the government's own commitment to advance the country's digital transformation. However, that same month, the cabotage policy was restored for the state of Sarawak at the state government's request so that only domestic vessels would be allowed to operate between peninsular Malaysia and Sabah and Sarawak on the island of Borneo.[33] The policy would not affect foreign vessels calling directly at the ports of Sarawak, but Putrajaya's reversal does underscore the impact that different stakeholders at various levels of government can have on cable repair capabilities in a country.

The average repair time for damaged cables in 2023 was forty days.[34] This was nearly half the duration it took in 2022, representing a marked improvement given the number of faults that occurred in 2023 alone. But repairs can be very expensive, ranging between $1 million and $3 million.[35] Extra costs may also be incurred to reroute and restore communications using undamaged cables.

Geopolitical hot spots and the specter of conflict in strategic waterways, such as the South China Sea and Taiwan Strait, are also fanning growing safety and security concerns about cable laying, maintaining, and repairing. The negative repercussions of such tensions were highlighted when three major cables connecting Europe and Asia were damaged in the Red

Sea in July 2024. Repair work depended on access to Yemeni waters, which was complicated by the country's internal turmoil and Houthi attacks in the Red Sea.[36] Media speculation in the aftermath of the outage about who and what caused the breaks did not help, either.[37]

Temperance is therefore a key lesson for what happens in and around Southeast Asian waters. In an already heated environment like the South China Sea, a rush to judgment or attribution of a cable break could result in an escalation of tensions.

Power Plays and Powerful Players

Geopolitics: The Securitization of Everything

In fact, geopolitical pressures have already begun changing the business of cables. China's far-reaching claims in the South China Sea have affected the timeline of the SJC2 and prompted a rerouting of at least two other cables—Apricot and Echo, which run through Southeast Asia and across the Pacific Ocean—around Indonesia instead.[38] Beijing's insistence on approving permits for work done even outside its internationally recognized territorial waters has delayed the SJC2 project (originally planned for 2020) by several years, even though some observers had hoped that China Mobile's participation in the cable consortium would incentivize China to speed the process along.[39]

The shadow of actual conflict erupting in the South China Sea is also increasingly a factor in rerouting new cables away from the area. But circumventing the South China Sea—the most direct route between Southeast Asia and the Pacific coast of the United States—makes cable laying more expensive because of the extra lengths of cable and additional sheathing required to better protect cables in the shallower waters near Borneo.

It is unclear whether long approval periods and other delays have been part of a larger U.S.-China tit-for-tat approach of securitizing digital infrastructure in particular and technology in general.[40] However, the effect has been decidedly unhelpful for third-party stakeholders. Not only does the rising securitization increase costs for all, but it also risks bisecting the entire tech ecosystem, forcing countries and corporations into difficult decisions about hardware, component parts, platforms, as well as personnel. Because cables are essential global infrastructure and therefore a crucial node of major power competition, decisions on where they are routed, who constructs them, and how ownership is structured are increasingly being filtered through the lens of national security. The irony is that even though modern-day fiber optic cables are built for worldwide connectivity, they are being repurposed as instruments of power and cleavage just as their telegraphic predecessors were.

For Southeast Asian stakeholders, many of whom were previously accustomed to more commercial calculations when planning cable linkages, a bifurcation of the marketplace on strategic grounds poses uncomfortable choices. The United States has reportedly been lobbying hard in the region to dissuade countries from opting for Chinese suppliers.[41] U.S. officials and companies met with Vietnamese and foreign officials as well as corporate representatives multiple times to convince the Vietnamese side that allowing HMN Tech, a major Chinese cable contractor, to build ten new cables by 2030 could present national security risks. The United States highlighted the possibility of cable sabotage and offered a warning that U.S. companies would be discouraged from investing in Vietnam if the country chose less-experienced contractors with limited access to critical components.

The U.S. effort in Vietnam has been complemented by at least six other similar campaigns in the past five years to shut out HMN Tech and ensure the United States remains derisked from China.[42] One of those campaigns involved the SEA-ME-WE 6 cable, which will connect fifteen countries when completed in 2025. HMN Tech, which offered the cheapest bid, had been poised to win the construction contract for that cable. But Washington intervened behind the scenes for an outcome favorable to the U.S.-based supplier, SubCom.[43] One key player in broader derisking efforts has been the Committee for the Assessment of Foreign Participation in the U.S. Telecommunications Services Sector, informally known as Team Telecom. Team Telecom comprises the Departments of Justice, Defense, and Homeland Security. It is advised by the secretaries of state, treasury, and commerce; the director of the Office of Management and Budget; the U.S. Trade Representative; the director of national intelligence; the administrator of the General Services Administration; the director of the Office of Science and Technology Policy; and various assistants to the president.[44]

In 2022, SubCom reportedly signed a master service agreement with Google to build cables in the Asia-Pacific and the rest of the world.[45] SubCom, a company established during the Cold War to further U.S. interests, pivoted to being more commercially oriented once the Soviet Union fell. It serviced telcos and technology companies worldwide regardless of origin. However, since Washington's more adversarial stance on Beijing, reporters note that SubCom "now works almost exclusively for the U.S. military and big U.S. tech firms."[46] A public-private partnership among U.S. companies and institutions is not in itself problematic for Southeast Asian stakeholders, but one that is intent on shutting out other parties at all costs based on its sole judgement—and that ends up splitting the internet landscape on the bases of hardware, software, and applications—will prove a longer-term challenge for the region to navigate.

In fact, for Southeast Asia, U.S. coercion on telecommunications infrastructure dates back at least twenty years. In 2002, the U.S.-based company Global Crossing—which owned and operated a fiber-optic network spanning 200 major cities in twenty-seven countries across five continents—petitioned for bankruptcy after struggling with $12 billion in debt.[47] Singapore-based ST Telemedia (STT) and Hong Kong–based Hutchison Telecommunications originally considered jointly purchasing 61.5 percent of Global Crossing.[48] However, Hutchison's links to mainland China drew considerable objection from

the U.S. Treasury Department's Committee on Foreign Investment and several members of Congress, causing the company to withdraw its interest and leaving STT to assume the majority stake in Global Crossing.[49] Despite close relations between the United States and Singapore, STT's buyout was still met with opposition from U.S. national security agencies, given the Singapore government's ownership of STT through its investment arm, Temasek Holdings.[50]

When STT's takeover of Global Crossing was finally cleared, a new entity, New GX, was consolidated and then subjected to a network security agreement with the U.S. government that exacted a suite of conditions.[51] These included keeping a "full and complete record of every electronic and written communication—related to interconnection agreements, security procedures and policy, major equipment purchases, and joint venture provisions" between New GX and STT "directors, officers, employees, and agents."[52] The agreement also required the creation of a network operations center on U.S. territory that could be visited by U.S. officials with a thirty-minute notice and the appointment of "security directors"—meaning directors with U.S. citizenship and U.S. security clearances—comprising 50 percent of the New GX board. Appointments could be vetoed by the Department of Justice, Federal Bureau of Investigation, Department of Defense, or Department of Homeland Security.

While Washington has tried to deter Southeast Asian stakeholders from contracting Chinese cable providers such as HMN Tech due to fears of espionage and forced data transfers, the reality is that regional countries face the same risks from the United States. Tapping underwater cables at depth is technically difficult, though not impossible: Some U.S. naval ships have been reported to potentially have this ability since 2005.[53] As such, interception is usually done where cables connect to landing stations. American whistleblower Edward Snowden's revelations in the mid-2000s about the National Security Agency's upstream and downstream surveillance nets exposed how the U.S. government siphoned vast amounts of metadata from around the world by tapping into the backbone of the internet, including cables, as well as by compelling search and social media platforms to hand over information.[54] In particular, the agency benefited from essential cooperation by telecommunications and tech giants like AT&T, Verizon, Microsoft, Google, and Facebook.[55]

The network security agreement that underpinned the sale of Global Crossing to STT has been similarly replicated in newer cable agreements. In December 2021, Team Telecom entered into national security agreements with Google and Meta to protect the data of U.S. persons on the Pacific Light Cable Network (PLCN) connecting the Philippines to the United States via Taiwan.[56] The agreement was a condition for the U.S. Federal Communications Commission to grant licenses to the tech giants to operate the PLCN along that route, after the commission initially denied a licensing application that included a portion of the cable connecting Hong Kong and the United States. As part of the national security agreements, Google and Meta are obliged to conduct annual risk assessments of sensitive data transiting PLCN, including when data exit the cable. The companies also have to diversify the cable's interconnection points to locations such as Indonesia, Thailand, Singapore, and Vietnam.

While these intensifying geopolitical pressures have been generally constricting for the cables industry, some countries in Southeast Asia are leveraging the fallouts of decoupling. As a result of the United States' co-option of the SEA-ME-WE 6 project and the subsequent withdrawal of the Chinese consortium partners, Telekom Malaysia Berhad and PT Telekomunikasi Indonesia International stepped in.[57] Staking an interest in the cable ensures greater bandwidth capacity for Malaysia and Indonesia and advances both countries' digital transformation policies.

Indonesia and the Philippines are proving to be especially attractive connection points for new cable routes as the United States and its allies lean into route diversification in and around Southeast Asia. (For example, enhancing "route diversity" was referenced in the U.S. Joint Statement on the Security and Resilience of Undersea Cables in a Globally Digitalized World, or the New York Principles, recently released on the sidelines of the 2024 United Nations General Assembly.[58])

The Bay to Bay Express Cable System—which was originally supposed to connect Singapore, Malaysia, Hong Kong, and the United States by 2020—had to be reconfigured due to the United States blocking direct connections between Hong Kong and China.[59] The parties withdrew their licensing application to the U.S. Federal Communications Commission despite the fact that most of the first 12,000 kilometers of cable from the United States to Hong Kong had already been built.[60] This withdrawal was filed two months after Team Telecom recommended that the commission partially deny the PLCN system, "to the extent that it seeks a direct connection between the United States and Hong Kong."[61] Meta and Amazon subsequently filed a new application for the cable to be rerouted to the Philippines without the participation of China Mobile, but in 2022, both tech companies completely withdrew the license application.[62]

More successfully, Google's and Meta's Apricot cable, scheduled to come online in 2026, will land in Guam, Indonesia, Japan, the Philippines, Singapore, and Taiwan.[63] Meta's (and Amazon's) Bifrost cable, originally scheduled for completion in 2024 but now delayed to 2025 due to permitting issues and rough weather conditions, will land in Guam, Indonesia, Mexico, the Philippines, Singapore, and the west coast of the United States.[64]

Yet, Southeast Asian countries are also still forging cable connections with China. The Asia Direct Cable, initiated by a consortium comprising Chinese, Japanese, Indian, and Southeast Asian owners, is scheduled to come online at the end of 2024 and will link China, Japan, Singapore, Thailand, the Philippines, and Vietnam.[65] The South-East Asia–Hainan–Hong Kong Express Cable System, built by HMN Tech and scheduled for service in 2025, will connect China, Malaysia, Singapore, Thailand, and the Philippines.[66]

Whether business can continue to be conducted as usual—that is, on mostly commercial calculations—as the political noose tightens will largely depend on how U.S.-China relations evolve over the next few years and whether Southeast Asian stakeholders can carve out strategic space for themselves to prioritize their own digital agendas. Regional countries also urgently need to factor in an increasingly influential, though still underrated, actor in the cable and connectivity context: hyperscalers.

Tech Titans

Hyperscalers are large enterprises that provide cloud, storage, and networking services at scale. Microsoft and Amazon, already dominant in this market space, together with content service platforms such as Google and Meta, are both the primary drivers and providers of an increasingly data-driven consumer and enterprise environment. This, in turn, is shifting the cable landscape from links that connect cities to ones that connect data centers.

In order to meet the upsurge in data and bandwidth demand as well as to service their unique infrastructure needs, hyperscalers since 2016 have begun pursuing ownership of capacity rather than simply purchasing it. Although the initial investment into a cable system can seem prohibitively costly (as transpacific cables average $400 million), the potential long-term returns can be worth it if demand for data and bandwidth can be sustained.[67]

This vertical integration strategy enables hyperscalers to control the internet services value chain, from the transportation and processing of data to storage and sale of that data.[68] Between 2019 and 2023, hyperscalers accounted for 23.5 percent of 102 cable systems that went into service.[69] Even when they are not sole owners of a cable, Big Tech companies' financial heft means that they are significant contributors to consortiums anchoring cables such as the SJC2 and the SEA-ME-WE 6.

Big ventures by Big Tech at multiple levels of the network value chain undoubtedly provide an investment, connectivity, and digitalization boon for Southeast Asia. But market consolidation of internet infrastructure, content, and data storage services by a few already powerful and foreign businesses accountable only to their boards and bottom line can leave regional countries exposed to corporate capture.

As outlined earlier, Google's and Meta's national security agreements with the U.S. government show that hyperscalers are not detached from geopolitical dynamics or objectives. These can have potentially deleterious effects for countries and their populations in less obvious ways.[70] U.S. national security agreements, for example, only extend the protections of data privacy and security to U.S. legal persons, not to citizens located in other countries who may continue to be surveilled on a mass scale, by any party, through U.S. technological infrastructure.

What Southeast Asian governments will have to bear in mind is that even as multinational companies adapt to local laws in one part of their operations, they may be guided by other imperatives in supplementary parts of their businesses that could adversely impact the interests of host countries. This incongruence will sharpen with intensifying geopolitical rivalry.

Recommendations

While every party can agree on the general notion of cable safety, security, and resilience, not all have a shared interpretation of what these elements look like in practice. Cable resilience for Southeast Asia, for example, could entail diversifying not just routes but also suppliers, quality, and costs. It could also imply interoperability in terms of construction, operation, maintenance, and repairs.

In February 2024, the fourth ASEAN Digital Ministers' Meeting announced plans to "build a secure, diverse and resilient submarine cable network" and "to facilitate the expeditious deployment, repair, maintenance, removal, and protection of submarine cables, between ASEAN Member States."[71] While details have been scant since, the group committed to recognizing best practices, of which there is no shortage.

Five years earlier, for example, ASEAN published its Guidelines for Strengthening Resilience and Repair of Submarine Cables. Although nonbinding in nature, the document sets out a promising baseline for member states to simplify regulations among themselves.[72] The document echoes the International Cable Protection Committee's own, longer list of best practices for governments to protect and promote cable resilience.[73] The ASEAN guidelines, however, do not address the more complicated issues of unresolved maritime delimitation exercises, territorial disputes, or differing interpretations of cable-related provisions in the United Nations Convention on the Law of the Sea.[74]

This article builds on a recent United Nations Institute for Disarmament Research report that treats cables as a core element of the broader information and communications technology ecosystem.[75] The author's prior work has offered complementary policy proposals on this topic.[76] This article reiterates the importance of integrating the topic of cables into broader cross-cutting discussions on technology and offers the following proposals to Southeast Asian stakeholders in the public, private, and other sectors.

- At the national level, **identify cables as critical infrastructure** and allocate resources accordingly. For Southeast Asian states that have a classification for assets, sectors, or services deemed critical for the day-to-day functioning of a modern nation, governments could include cables in that list if they have not already done so. This would not only acknowledge the importance of cables as the backbone of communications and connectivity but also clarify policy approaches to protecting cable resilience. Categorizing cables as critical infrastructure should also ensure sufficient financial and other resources dedicated to preserving their integrity. In some cases, this determination of critical infrastructure could form the basis for nationwide exercises to anticipate and prepare for cyber, kinetic, or hybrid attacks.[77]

- At the national level, **institutionalize and regularize interagency and cross-disciplinary discussions** impacting cables. This would facilitate improved information flows on the range of factors affecting cable resilience and promote a clearer-eyed

view on national security and geopolitical implications of trends in the cable industry. However, as others have pointed out, environmental concerns exacerbated by the climate crisis are frontline for industry.[78] These concerns receive insufficient attention in climate-change-susceptible Southeast Asian countries and should figure more prominently in internal discussions. Broadening conversations on cables to include the scientific community and cross-disciplinary experts could improve the onboarding process for analyses and recommendations, such as those provided by independent experts.[79]

- At the national and regional levels, **take a long, critical view** of how cable construction in the mid- to late nineteenth century changed the topography of Southeast Asia for imperial pursuits and how the data-driven infrastructure and industry of today, including cables, could impact the digital future of countries in the next few decades.[80] Although data is often compared to oil, a more apt comparison might be gutta-percha—a plastic-like substance extracted from a species of trees producing resin that became a sealant for the early telegraphic cables laid on the ocean floor. In what is now Malaysia, Singapore, and parts of Indonesia, gutta-percha had been extracted almost to the point of decimation, a cautionary analogy for how data in and from Southeast Asia also risks excessive extraction and commodification. Ultimately, Southeast Asian stakeholders will need to assess whom these operations really benefit.

- At the regional level, **maintain an up-to-date database of cables traversing Southeast Asia** including details on ownership as well as countries' policies and regulations on cables. The academic community has created a basis for regulation summaries that could be built upon with the necessary support.[81] Adding information on ownership and cable ship bases in the region would aggregate regional data in a single location and provide transparency for researchers and policymakers on the future of cables in Southeast Asia.

- At the ASEAN level, **join the International Cable Protection Committee**—an organization comprising both governments and commercial players that own or operate cables—to stay informed about developments in the cable industry in a more streamlined manner. Membership would require a point of contact within ASEAN, whether within the Secretariat or by nomination from among member states, to participate in committee activities. It would also demand approval of a budgetary allocation for the committee's associate membership fee of £2,200, or $2,800 (at the time of writing).[82] Given the collaboration between the International Cable Protection Committee and the International Telecommunication Union to form an International Advisory Body for Submarine Cable Resilience, whose term began November 1, 2024, ASEAN member states may wish to keep apprised, if not actively shape the contours, of the cable seascape in and around the region.[83]

About the Author

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Notes

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