

AN OVERVIEW OF CHALLENGES AND OPPORTUNITIES OF TECHNOLOGICAL ADVANCEMENTS UNDER INTERNATIONAL LAW: 5G IN THAILAND

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บทคัดย่อ

บทความนี้ศึกษากรอบกฎหมายระหว่างประเทศที่เกี่ยวข้องกับโอกาสและความท้าทายในการกำกับดูแลเทคโนโลยี 5G อีกทั้งศึกษาและประเมินกฎหมายไทยในปัจจุบันที่เกี่ยวข้องกับการใช้เทคโนโลยี 5G โดยใช้วิธีวิจัยเชิงคุณภาพ โดยรวบรวมและวิเคราะห์ข้อมูลจากเอกสารของมหาวิทยาลัย วารสารวิชาการ เว็บไซต์ และข่าวสารที่มีเนื้อหาเกี่ยวข้องกับเทคโนโลยี 5G ผลการศึกษาพบว่า ไม่มีกฎหมายระหว่างประเทศที่ใช้เฉพาะสำหรับเทคโนโลยี 5G อีกทั้งขอบเขตและการบังคับใช้กฎหมายระหว่างประเทศอยู่ภายใต้ข้อจำกัดบางประการ อย่างไรก็ตาม กรอบทางกฎหมายและสถาบันระหว่างประเทศจำนวนมาก มีอิทธิพลต่อการพัฒนาเพื่อใช้งานและการกำกับดูแลเทคโนโลยี 5G ส่งผลให้การใช้เทคโนโลยี 5G จำเป็นต้องได้รับความร่วมมือระดับโลกในการจัดตั้งกรอบการกำกับดูแลที่ส่งเสริมนวัตกรรม ตลอดจนปกป้องสิทธิของผู้ใช้จากข้อกังวลต่าง ๆ สำหรับประเทศไทย ปัจจุบันได้มีการปรับปรุงกฎหมายเพื่อรับมือกับความท้าทายและโอกาสใหม่ๆ ที่เกิดจากเทคโนโลยี 5G เพื่อให้การเปลี่ยนผ่านไปสู่เทคโนโลยี 5G มีนโยบายและข้อบังคับใหม่ ๆ เช่น การจัดสรรคลื่นความถี่การปรับใช้โครงสร้างพื้นฐาน การคุ้มครองข้อมูลส่วนบุคคล ตลอดจนความปลอดภัยและการแข่งขันในภาคโทรคมนาคม

คำสำคัญ: เทคโนโลยี 5G กฎหมายระหว่างประเทศ การกำกับดูแล

Abstract

This article examines the international legal framework concerning the opportunities and challenges in regulating 5G technology. It also studies and evaluates current Thai laws related to the utilization of 5G technology through a qualitative research methodology, collecting and analyzing data from university documents, academic journals and websites, as well as information relevant to 5G. According to the findings, there is no international law specifically dedicated to 5G technology. Moreover, the scope and enforcement of international law are subject to certain limitations. Numerous international legal frameworks and institutions have affected the development, the utilization and regulation of 5G technology, leading to the need for international cooperation to create a legal framework that fosters innovation while safeguarding users' rights against diverse issues. Thailand has already amended its legislation to address emerging challenges and opportunities of 5G technology. To facilitate the transition to 5G technology, new policies and regulations have been introduced, encompassing spectrum allocation, infrastructure deployment adjustment, personal data protection, security, and competition within the telecommunications sector.

Keywords: 5G technology, international laws, regulation

1. Introduction

International law is profoundly affected by technological change, which shapes national interactions, trade, and global problem addressing. International law has to change as new technologies are developed to fit the benefits and difficulties they bring. Reacting to these technical developments, treaties, conventions, and international organizations have been created to create and enforce guidelines and norms controlling worldwide usage and influence of technology. Developing international legal frameworks that fit technical changes depends much on the United Nations (UN), the World Trade Organization (WTO), the International Telecommunication Union (ITU), and regional organizations. There was no international law tailored especially for 5G technology. Nonetheless, the evolution, implementation, and control of 5G networks are much shaped and guided by several current international regulatory frameworks and organizations.

In the realm of 5G technology, effective policy formulation harmonizes the legal and regulatory framework with the sector's technical and economic attributes, as well as the overarching social aspirations linked to new technology (Finger et al., 2005). Two principal categories of factors shape the current discourse on 5G policy. Policy is to limit the influence

of significant entities to prevent market manipulation and preserve competition. While evaluations of substantial market power are integral to the conventional regulatory framework, the interconnection among participants in the 5G ecosystem creates novel and distinct problems, including the delineation of pertinent markets and the management of enterprises operating across numerous interconnected markets. The policy aims to choose market designs that enhance the inventive capabilities of 5G technology. Innovation thrives in a space characterized by contestability and transient (but non-structural) market power (Shapiro, 2011), resulting in contradictions between the restrictive and promotional objectives of regulation. The future advancement of 5G technology and markets is unpredictable; therefore, policy must be formulated with limited information and in the face of ambiguity. The deficiencies in understanding are generally addressed with a synthesis of compelling visuals depicting a prosperous 5G future and enduring historical traditions.

The remainder of the article is organized as follows. This article will first provide an overview of 5G technology in Thailand, with a conceptual framework and analysis of the effects of 5G policies in Thailand. It will, next, present an account of international laws and their limitations on the development of 5G technology. This will then be followed by debate on attempted regulation of 5G technology under the umbrella of international laws. The later part will be dedicated to shedding light on how to integrate strands in relation to the 5G technology and put forth appropriate regulatory frameworks well suited to market settings in Thailand. The final part presents a recap on insightful explanation and analysis brought earlier.

2. Objectives

2.1 To study how international organizations and legal frameworks react to the difficulties and opportunities brought about by 5G technology.

2.2 To study and evaluate the current Thai legislation pertaining to the utilization of 5G technology.

3. Study methods

This qualitative research involved document analysis through the collection and examination of material from university sources, academic journals, websites, and pertinent news regarding 5G technology.

4. Results and analysis

4.1 Overview of 5G technology in Thailand

The fifth generation of wireless communication technology or 5G represents a significant leap in terms of speed, capacity, latency, and capabilities compared to its predecessors (Sultan, 2022).

The drivers of industry development saw 5G communications as crucial to improving consumer experience and bringing about digital industry transformation. 5G is crucial to the long-term industrial development of major economies worldwide. So, it is crucial to keep studying how 5G networks will evolve in the future and to think about how to improve their architecture and their functions thoroughly (Huawei, 2021).

In Thailand, 5G technology is one of the technologies expected to unlock the potential across various sectors. Therefore, the establishment of national policies and plans that directly support the adoption of 5G technology is essential to implement 5G in Thailand. For the national plan, Thailand has national policies and plans that promote the use of digital technology and innovation for national development. Thailand is well-equipped with laws and regulations that allow various sectors to utilize 5G technology to a certain level. However, laws and regulations should be updated to facilitate the utilization of 5G technology at a higher level of efficiency and prevalence. At present, the government promotes the trial and testing of the utilization of 5G technology in the 5G Testbed area. However, there are still unclear policies and guidelines to support the use of 5G technology in the business sectors, especially small and medium-sized businesses, resulting in them being unprepared for investment. Currently, most businesses have applied digital technology to their business operation through 3G / 4G networks. The business sector is of the opinion that, currently, the 3G / 4G technology is not utilized in full efficiency. The business sector is not yet aware of the importance and potential of 5G technology. There is also a lack of knowledge and understanding about the differences between 4G and 5G technology result; the business sector is unable to assess the worth of investment and benefits they will receive from switching to 5G technology in both short and long term (ONDE, 2022).

4.2 International law and constraints on technological advancement

Each new technological development invariably has significant repercussions for the lives of people. The development of new technologies can foster innovation in products, services, and processes, as well as assist the resolution of problems on a national and international scale. Nevertheless, the probable dangers that are posed by technological advancements, such as

the inappropriate use of technology, have the potential to have adverse, and even catastrophic, effects on both individuals and the environment on a global scale (Wilson, 2013). No legally enforceable international agreement exists to govern technological advancements and mitigate their potential hazards. All states are nonetheless obligated to adhere to general legal principles and international customary norms that align with technological advancement and implementation. Fundamental principles and customary international norms encompass the fundamental principles of international peace and security law (Gray, 2008); the basic principles of international humanitarian law (Henckaerts et al., 2005); the basic principles of human dignity and the right to life, liberty, and security of the person; and the basic principles of international environmental law and the customary rules on state responsibility and liability for harm also apply (Crawford, 2002). There is no singular legally binding international law governing technological development; however, general principles of law, as a source of international law, represent an authoritative acknowledgment of the dynamic nature of international law and the creative role of courts that may enforce it (Brierly, 1936). In this condition, general principles have functions, one of which is they could be applied as norms whenever there are no formulated norms governing a given question.

Within the context of technological advancement, the focus of international law does not pertain to its essence. International law focuses on the possible detrimental transboundary impacts on humanity, the environment, other nations, and global interests. According to the principle of state sovereignty, all states are obligated to ensure that activities within their authority do not hurt neighboring states.

Other limitations relating to the capacity of international law lie in the formal sources of international law. Certain obligations are covered in international agreements. As can be seen, making an international agreement is a time-consuming, cumbersome exercise, and international agreements are focused on regulating specific activities rather than future ones. So, there is no international law forcing a state to become a party to the international agreement. In addition, the other problem faced by international law relating to its role in technological advance is the absence of law enforcement mechanisms, even when a state has become a party to an international agreement.

4.3 The disparities in 5G technology regulation under international law

Numerous researchers assert that technology and regulation represent two opposing concepts. Technology epitomizes markets, enterprises, and expansion, whereas regulation signifies government, bureaucracy, and constraints on growth (Wiener, 2004). Today, discourse

persists over the apprehensions surrounding electromagnetic fields, greenhouse gas emissions, fiber optics, genetically engineered foods, and similar issues, prompting renewed demands for preventive regulation (Latifah & Imanullah, 2018).

The implementation of 5G technology has ignited considerable discourse over regulation under international law, owing to its prospective worldwide influence on communication networks, economies, and security.

There are some key aspects of the debate surrounding the regulatory framework for 5G technology under international law:

4.3.1 National security concerns

The rollout of 5G networks involves critical infrastructure. That can be targeted for espionage or cyberattacks, such as introducing vulnerabilities or malicious components into the network. Many countries are concerned about potential security risks posed by the involvement of certain companies or state actors in building and operating 5G networks.

4.3.2 Supply chain diversification

The dominance of a few companies in providing 5G equipment raises concerns about supply chain vulnerabilities. Countries are debating how to diversify supply chains to reduce dependence on a single source for crucial technological components.

4.3.3 Standardization and interoperability

5G technology requires global standards to ensure seamless interoperability across networks and devices. International bodies and industry players are discussing how to create a standardized framework that facilitates cross-border communication.

4.3.4 Spectrum allocation

Efficient spectrum allocation is critical for the successful deployment of 5G networks. International coordination is needed to allocate and manage the necessary radio frequency spectrum for 5G without causing interference or congestion.

4.3.5 Competition and market access

The competitive landscape of 5G technology is a subject of debate. Some argue that fair competition is essential to drive innovation and investment, while others are concerned about market access barriers and unfair practices.

4.3.6 Data protection and privacy:

The increased data processing and transmission capabilities of 5G networks raise concerns about data protection and privacy. International standards and agreements are being discussed to ensure that personal data is handled responsibly and in compliance with relevant laws.

4.3.7 Intellectual property and patents

The development of 5G technology involves numerous patents and intellectual property rights. Debates center on how to strike a balance between protecting these rights and ensuring that essential technology is accessible and affordable for widespread adoption.

4.3.8 Global connectivity

5G has the potential to bridge the digital divide and bring connectivity to remote areas. Discussions are ongoing about how to ensure equitable access to 5G technology, especially in underserved regions.

4.3.9 International cooperation

The deployment of 5G technology is a global effort that requires international cooperation. Countries are discussing collaborative approaches to research, development, and deployment to maximize the benefits of 5G for all.

4.3.10 Regulatory harmonization:

To facilitate cross-border operations and investments, there are debates about harmonizing regulatory frameworks related to 5G technology. This involves finding common ground on issues such as spectrum allocation, security standards, and licensing requirements.

4.3.11 Trade and economic impact

The deployment of 5G networks can have substantial economic implications, impacting various sectors, including telecommunications, manufacturing, healthcare, and transportation. Debates arise over how to ensure a level playing field for international trade in 5G-related goods and services.

4.3.12 Environmental considerations

As 5G infrastructure expands, discussions center on its environmental impact. These include energy consumption, electronic waste, and sustainability of manufacturing processes.

The intricate and interrelated characteristics of 5G technology render discourse on its regulation under international law inclusive of several stakeholders, including governments, regulatory authorities, industry participants, civil society, and academic institutions. Efficient international collaboration and discourse are crucial to tackling the difficulties and opportunities posed by the global implementation of 5G networks. International law is urged to proactively establish new forms of international regulation and governance that can anticipate, assess, minimize, and mitigate the risks posed by emerging or novel technologies, including the potential for their rogue deployment by a state or individual acting unilaterally (UNEP, 2012). In other words, international law is being called upon to regulate not just the past and present development and deployment of technologies, but also the uncertain futures these technologies pose.

4.4 Discussions: regulation of 5G in Thailand

The emergence of 5G technology facilitates a novel service paradigm across various industries. Consequently, laws and regulations must be revised to align with the advancements in 5G technology and new services associated with it, applicable to the telecommunications sector as well as other industries. The primary difficulty in Thailand is to enable the incorporation of digital technology within the legislative framework. There are examples of relevant laws and regulations in Thailand.

4.4.1 The laws supporting the adoption of 5G technology (5G Use Cases)

The evolution of digital technologies influences the establishment of various new services. This also pertains to 5G technology, which not only improves mobile communication efficiency but also facilitates a new array of services with enhanced efficacy. Thailand does not endorse certain technological applications. Conversely, most nations that have implemented 5G technology have modified legislation that restricts its utilization (3GPP, n.d.). Laws and regulations should be revised to facilitate the application of 5G services for Thailand context to promote the effective and wide-scale utilization of 5G technology in various industrial sectors.

4.4.2 Infrastructure sharing regulation

The National Broadcasting and Telecommunications Commission (NBTC) has implemented legislation concerning the pooling of telecommunications infrastructure for wireless networks. This legislation prioritizes the sharing of telecommunication towers exclusively at the macro site level, neglecting the micro/pole site level, which is crucial for the extension of 5G network coverage. Simultaneously, foreign nations have amended regulations concerning the

expansion of telecommunication networks, such as the United Kingdom's regulations promoting infrastructure and telecommuting tower sharing, which prioritize network coverage in rural regions, and China's regulations permitting telecommunication service providers to install equipment in designated public areas (ONDE, 2022).

Therefore, Thailand ought to implement legislation or policies to facilitate the sharing of telecommunications infrastructure for wireless networks, namely at the micro/pole site level, to enhance the quality of 5G coverage across the entire nation.

4.4.3 Cyber security and privacy measures

It is essential to enhance cyber security and privacy regulations, particularly with the utilization of third-party data, to ensure they are updated. In the United Kingdom, legislation has been revised to encompass the safeguarding of personal information related to data created by IoT systems and to provide criteria for the storage of sensitive information in a distinctive encryption format to enhance cybersecurity and user confidence. Similarly, Thailand ought to enhance regulations regarding the use of third-party data (ONDE, 2022).

At present, Thailand is compelled to make amendments to their laws and regulations to encourage investment in infrastructure and implementation of 5G technology in vertical industries. Therefore, at the very least, the following laws and regulations need to be reconsidered:

- 1) Laws and regulations related to 5G network equipment imports and installations, as well as 5G customer premises equipment imports
- 2) Laws regarding spectrum sharing, spectrum leasing, and spectrum trading
- 3) Regulations for in-band migrations
- 4) Regulations related to the expansion of 5G networks, e.g. small cell installation approval procedure
- 5) Laws and regulations that support the implementation of 5G use cases such as telehealth, vehicle-to-everything (V2X), and drones.

5. Conclusion

International law, despite its constraints, should play a role in controlling the development and utilization of technical advancements. To improve comprehension of the interaction between technological advancements and law, particularly international law, it is preferable to establish

an international regulatory framework that fosters technologies promoting human flourishing while simultaneously mitigating unacceptable applications.

6. Recommendations

To maximize the economic and societal benefits of 5G technology in Thailand, it is imperative to implement reforms and support advancements to achieve the anticipated economic value efficiently. This requires collaboration across government, business, educational, and public entities to collectively cultivate an ecosystem ready for the implementation of 5G technology. The key development issues that need to be addressed are as follows:

6.1 Recommendation for future studies

It is advisable to investigate and conduct trials on utilizing 5G technology to develop new services that are appropriate for the country's evolving context and to diminish its dependence on technology imports.

6.2 Policy recommendation for digital communications

6.2.1 Raising 5G awareness and knowledge creation in all sectors are crucial for maximizing the potential of 5G technology and driving economic growth, societal benefits, and innovation.

6.2.2 5G use cases implementation in vertical industries is paramount. This is to set clear examples of how services operate under 5G networks, which can show the potential of 5G technology.

6.2.3 5G network expansion is needed to support high-quality 5G service provisions as well as extend coverage in various regions, including economic zones and rural areas.

6.2.4 Amendments to laws and regulations are necessary to support the acceptance of new services, assist network providers in their expansion efforts, and promote investment and implementation of 5G technology in many industries.

6.2.5 5G digital workforce development is a crucial process to help enhance the capabilities of Thailand's digital workforces, which should be focused on meeting the labor market demand.

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