Unlocking digitalisation: Shaping the next era of capital markets

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Abstract This paper examines the digitalisation of the Thai capital market and outlines the strategy of the Securities and Exchange Commission Thailand to support this transition. It identifies persistent inefficiencies, including fragmented data, manual processes, high costs and inconsistent standards, which limit efficiency and transparency. The paper presents the digital securities ecosystem, designed to enable end-to-end digital processes across issuance, trading, settlement and custody. It discusses the application of distributed ledger technology, block chain and smart contracts to improve data sharing, automation and real-time settlement.[1] Supporting measures include legal reform to enable digital securities, regulatory sandboxes for innovation testing,[2] and enhanced supervision using data-driven tools. The paper emphasises investor readiness, governance and standardisation as crucial to adoption and trust. It argues that digitalisation can enhance liquidity, reduce costs, increase transparency and support financial inclusion. Overall, it provides a policy and implementation perspective on enabling digital transformation while maintaining market integrity and investor protection, and offers practical insights into aligning innovation with regulatory objectives effectively. It also notes the importance of interoperability, data standards and cross-sector collaboration in delivering scalable outcomes, as well as highlights initiatives and pilot projects that demonstrate practical use cases in the Thai capital markets. This article is also included in **The Business & Management Collection** which can be accessed at https://hstalks.com/business/.

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AN OVERVIEW OF DIGITAL SECURITIES ECOSYSTEM

The capital market is an essential mechanism in supporting economic development. By offering diverse investment options, the capital market has been an alternative source of funds for businesses, especially in supporting business expansion and employment. The Thai capital market has developed to meet various needs and adapt to changes over the years. In recent years, one of the important factors that the capital market has experienced is the development of technology, which has influenced investor needs and also regulatory adjustment. Despite recent changes, further developments remain necessary in some areas. For instance, by law, corporate bonds in Thailand must be issued in physical form, and their registration depends on manual work. The initial offering and the registration process are time intensive in both the primary and secondary markets. The registration data is not unified, leading to multiple sources of truth and a lack of standardisation among registries. This has led the market to function inefficiently.

As the market evolves, businesses expressed interest in digitalisation. At the start of the digital transition, businesses began generating and offering their product in digital form under the Securities and Exchange Commission Thailand (SEC Thailand) Sandbox. Four initial projects issued digital bonds (digital twin), with a total value of THB 6.7bn. This enables a convenient and transparent bond issuance process. However, regulatory restrictions on the issuance of digital native bonds remain.

Moreover, in recent years, businesses have offered their products in digital form. Four successful real-world assets (RWAs) are now offered in Thailand, with a combined value of THB 5.5bn. Three of the four projects share a focus on offering investors the right to a future revenue from underlying assets, namely real estate or condominiums. The remaining project offers investors right to share in the profit of a specific development. Four additional projects are currently under consultation with the SEC Thailand, one of which focuses on environmental issues. This aligns with the SEC Thailand's strategic plan to advance the digital economy and promote a sustainable capital market.

These business dynamics highlight the demand from digital natives and the movement towards digitalisation in the Thai capital market. The SEC Thailand has acknowledged the need to develop and strengthen the market by providing an effective framework that meets both investor and industry requirements while keeping pace with technological advancements. Therefore, the SEC Thailand has prioritised this initiative and incorporated it into the SEC Thailand's strategic plan to facilitate transition of Thailand's capital market into a fully digital system.

The SEC Thailand is facilitating the digital securities ecosystem (DSE), a framework designed to develop an ecosystem that supports digital transactions in the capital market. Its main objectives are to achieve a fully digital market, enhance market efficiency, reduce financial burdens on businesses and foster business growth the use of digital technology. To accomplish such objectives, contributions from several areas are required, which will be elaborated further as follows:

- The development of the DSE
- The legal framework preparedness
- Investor readiness (particularly in terms of financial and digital literacy)
- Improvement of supervision in response to technological advancements

THE DEVELOPMENT OF THE DSE

In this context, digital transformation refers to the application of technologies in capital market activities. As mentioned earlier, these activities include the issuance and offering of securities, securities trading services, investor services, clearing and settlement as well as asset service activities. The SEC Thailand has introduced the DSE to support the transition of the Thai capital market towards digitalisation. Developing a digital ecosystem for the capital market sector has the potential to improve efficiency of capital market activities, as the use of technologies can reduce market obstacles. One main area that can be leveraged by the use of technologies is manual operations, as capital market transactions require both cross-entity and cross-functional coordination and rely heavily on back-office labour. The use of technology has the potential to increase market efficiencies in terms of the time efficiency settlement times and enabling atomic settlement. Among the other benefits of applying technologies in business operations is the increase in transaction transparency.[3] Moreover, the DSE facilitates digital connections among stakeholders, enabling efficient data exchange. This DSE connectivity enhances efficiency, reduces cost, increases transparency, establishes standardised practices and, importantly, fosters innovation.

Expected outcomes of SEC Thailand's DSE

As corporate bonds have faced challenges related to liquidity and data inconsistency issues, the SEC Thailand has outlined objectives to leverage the corporate bonds market for greater efficiency and liquidity. To achieve such objectives, the initial development of the DSE will prioritise the corporate bond sector. The SEC Thailand expects the DSE to strengthen the following areas:

- Enhance liquidity: Digitalising the corporate bond market can increase liquidity while improving convenience and the accessibility of the investment process for investors.
- Automated process: Employing technologies such as smart contracts in the workflow can reduce reliance on manual paper processes and shorten settlement times, thereby lowering operational costs.
- Transparency Data: Storing data on Blockchain can enhance transparency.[4]
- Real-time Settlement: The use of smart contracts enables settlements to occur instantaneously in real time.[5,6]
- Financial Inclusion: This helps lower barriers for retail investors, improving their access to and investment in financial products.
- Enhance Standardisation: This will help establish common standards or guidelines to support stakeholders.

SEC Thailand road map on the DSE

Achieving the benefits of the DSE requires the use of solid strategies; therefore, the SEC Thailand has initiated a road map to ensure that the ecosystem is properly developed and aligned with stakeholder needs. The broad scope of this road map is outlined as follows:

- Support standardisation and technical practices (such as data structure, token and smart contract standards, an interoperation protocol that is shareable across all platforms) by engaging with groups or associations to ensure alignment with business operations.
- Enable the development of a transaction record centre by setting up a data aggregator to improve monitoring and analysis of the digital capital market.
- Encourage use cases or pilot projects to experiment with issuing digital bonds, assessing both commercial possibility and supervisory suitability.

Some businesses are interested in employing technologies in their operations such as the adoption of Blockchain technology and issuing corporate bonds and money market fund tokens to enhance transaction efficiency. The SEC Thailand recognises this readiness and encourages operators to apply such technologies into their operations while prioritising investor protection, market integrity and long-term trust. In addition, business operators are allowed to test their technologies within the SEC Thailand's sandbox scheme.

The use of stablecoins and the regulatory sandbox

The procedures within the DSE work automatically, including the settlement process. Therefore, using fiat currency as a settlement mechanism may not be suitable for the ecosystem. To facilitate instantaneous payments and atomic settlement within the DSE, the SEC Thailand is now considering the use of stablecoins in this closed-loop electronic securities ecosystem. Nevertheless, in Thailand, issuance of stablecoins denominated in Thai baht and their use for payments are considered regulatory activities under the Payment Systems Act and fall under the regulatory authority of the Bank of Thailand (BOT). This Act aims to supervise the operation of payment systems and payment services for achieving stability, security and efficiency of the overall payment systems in line with international standards, including supporting payment innovations.[7] Therefore, the SEC Thailand has taken this into account and regularly consults with the BOT to foster development and enhance the integrity of the ecosystem. At the same time, the SEC Thailand has introduced the Regulatory Sandbox for business to test their technology innovations in a controlled environment. The SEC Thailand evaluates the participants' qualifications in various areas, including capital adequacy, work systems, management structure and conditions for relevant operations under the Sandbox to ensure that participants are well prepared to provide such services, particularly settlement systems that may be facilitated by the use of stablecoins.

The launch of the Sandbox has elicited a positive response from businesses. Three projects have been approved under the SEC Thailand Sandbox and the BOT Sandbox regarding the programmable payment.[8] These Sandboxes make it possible for businesses to test their digital innovations and the settlement of payments and related transactions using technologies such as distributed ledger technology (DLT) and smart contracts.[9] Under these approved projects, the conversion of regulated US dollar stablecoins to programmable payments (exclusively in baht-backed stablecoin) is allowed for making purchases from the specific merchants and within designated areas in Thailand. There are four other projects that have shown interest in applying for testing under the Sandboxes, which are in the pre-consulting process. These projects, together with the aforementioned digital bond projects from the industry, indicate businesses' demand to explore broader opportunities and enhance their service efficiency through the use of technologies.

THE LEGAL FRAMEWORK PREPAREDNESS

Digital securities

Background

The SEC Thailand has undertaken an initiative to enable the DSE and has also prepared the atomic settlement function by adopting stablecoins as a means of settlement. In addition, to ensure its proper functioning, the regulatory sandbox has been introduced to allow businesses to test their innovations. Nevertheless, to support efficient transactions on the DSE, facilitate business fundraising and improve investor accessibility, businesses are expected to issue securities in digital form (or in fully digital form).

The SEC Thailand recognises the urgent need to introduce digital securities, — securities issued entirely in digital form. All processes involving digital securities, including data recording, securities transfer and collateral use, can be completed via an electronic system without physical certificates. These are considered digital-native securities, issued and transacted exclusively within a fully electronic system.

Earlier referenced digital bond issuance was tested under the sandbox. In these initial projects, issuers are allowed to issue bonds in digital format and offer them to a restricted group of investors via an electronic platform. These digital bonds transactions, from filing, subscription and registration to post-sales report submission, are completed within the system with efficiency and security. Nevertheless, these testing projects were limited to the issuance of digital twin bonds. The digital securities concept is not yet covered under the current regulatory framework, as issuers are still required to provide physical certificates (scrip form) whenever requested by the investors. The coexistence of paper and digital formats prevents the system from being fully digital and imposes higher costs on business to maintain a dual system. To ensure the legitimacy of digital securities and establish a legal framework, the SEC Thailand is in the process of amending the related law.

The SEC Thailand expectation

As the SEC Thailand seeks to promote the full digital functioning of capital market transactions, legislative preparation and amendment are underway to enhance trust in the capital market. The new regulation prioritises facilitating the digital securities' life cycle to be entirely digital; in other words, physical certificates are no longer required. This is especially the case with processes such as issuance and offering, transfer, information amendment and collateral use. As technology and innovation evolve rapidly, the SEC Thailand leaves decision on underlying technology to businesses, enabling them to make sound choices and select solutions appropriate to their needs.

Regulatory supports for digital securities

The SEC Thailand aims to leverage capital market transactions to become fully digital, covering end-to-end process in alignment with regulations, adhering to appropriate standards, enhancing international competitiveness and efficiently meeting investor needs. The SEC Thailand is in the process of amending the law and introducing new rules to facilitate the use of digital securities, particularly in issuance, transfer, collateral use and collateral enforcement. The new rules additionally cover electronic standards and specified characteristics of digital securities.

At the primary stage, the SEC Thailand plans to implement the legal framework on digital securities in three areas, ensuring that they carry the same legal effects as securities with physical certificates.

First, the ownership of digital securities shall be verifiable through the exclusive control of persons or entities over such securities. The digital methods and systems used must identify the uniqueness of the person in control and their rights, whether exclusive control or possession. It is therefore crucial for digital securities to uphold technological standards throughout the life cycle, especially in transferring digital securities. Exclusive control must be transferrable, and the notion of transfer must be clearly defined. In addition, and most importantly, the methods and systems shall prevent unauthorised replication and multiple claims by unauthorised persons.

Secondly, the requirements on the characteristics of digital securities shall be maintained to provide essential details of securities (eg name of issuer, name of owner, securities number and so on). The digitally generated statement shall be accurate, complete, accessible and retrievable. Any adjustments must be clearly identified.

Finally, the legal framework for using digital securities as collateral and enforcing such collateral shall be specified to provide clear guidelines for businesses.

The SEC Thailand has outlined that corporate bonds will be the first type of securities to be issued as digital securities, in view of existing barriers in the bond market sector and to streamline investor accessibility. This transformation will set the stage for the standardisation of digital securities and serve as a good example for other types of securities to follow.

As mentioned previously, the SEC Thailand adopts a broader approach to business and encourages the adoption of technology without limiting specific types, recognising its capacity to foster innovation and drive *market development*. The preferred technology, however, must satisfy the legal and technological requirements, as ensuring the legal status of the digital securities is vital. This approach not only modernises Thailand's capital markets but also lays the foundation for a future where technology drives transparency, efficiency and growth in the sector.

INVESTOR READINESS

The SEC Thailand prioritises investor readiness, particularly by enhancing financial and digital literacy. The SEC Thailand promotes awareness and educates investors about the benefits of digital securities and the DSE. For instance, increased transparency delivers advantages such as standardisation, stronger investor protection and more convenient and faster access to investment, especially for retail investors.

The extended objectives also encompass promoting the adoption of digital securities among investors to ensure their broad acceptance and recognition as a mainstream investment instrument.

THE SUPERVISION IMPROVEMENT IN RESPONSE TO TECHNOLOGICAL ADVANCEMENTS

Technology-driven supervision

As technology evolves, it offers benefits but also poses challenges for regulators in addressing related risks. The SEC Thailand has responded by adopting a data- and technology-driven supervision framework. Under its technology adoption approach, the SEC Thailand has developed an e-reporting system with an automatic alert function to strengthen supervision capacity. This use of technology enhances the effectiveness of market misconduct detection and, importantly, ensures the protection of investors in both the capital market and the digital asset market. This method can also detect suspicious accounts and transactions to prevent digital asset mule account and combat scams. Real-time monitoring also ensures fair and transparent markets.

In order to prevent market abuse activities in the securities market, the SEC Thailand applies technology such as surveillance systems and data-driven tools to enhance the effectiveness on trading monitoring. Additionally, using artificial intelligence (AI), the SEC Thailand collaborates with trading venues and business operators to monitor and detect suspicious activities. This approach enables real-time monitoring and provides authorities with the opportunity to address risks promptly.

THE SEC THAILAND APPROACHES ON ENCOURAGING THE DSE

The SEC Thailand's introduction of the DSE to encourage technology adoption was self-initiated and influenced by the industries' demand for capital market development.

The SEC Thailand conducted researched and worked closely with industries as part of its strategic planning process. The research highlighted several areas of the market in need of development, one of which was digitalisation, which was later integrated into the strategic plan for 2025–2027. The SEC Thailand's research found gaps in the utilisation of technologies in business, such as inefficient data exchange between businesses (non-interoperable databases), underuse of infrastructure and legal barriers. Other previously mentioned issues include the time-consuming nature of transactions, rising costs and the complexity of systems. Following its engagement with industries, the SEC Thailand has planned to enable and facilitate the implementation of technology in response to industry demand.

Over the same period, other countries have moved in a similar direction. For instance, Singapore has initiated Project Guardian and Project Global Layer 1, while Project Trident, which is a cooperative project of private banks in Switzerland, Singapore and Japan. Despite differences among projects, they demonstrate that the implementation of technology in capital markets is inevitable. Technology has the potential to enhance efficiency in capital market mechanisms by automising workflows and creating seamless, connected process, especially its potential in bridging the gap in interoperability of data exchange. The SEC Thailand acknowledges the progress of each project and its benefits for the capital market. As there is no uniform approach, the SEC Thailand considers approaches based on the suitability for Thailand's ecosystem. Therefore, the SEC Thailand is introducing a tokenisation standard to ensure interoperability within the industry. While the initiative focuses on the domestic level, there are plans to explore and leverage interoperability across the region as a step towards global expansion.

To foster a suitable environment for businesses, the SEC Thailand has offered businesses the opportunity to test their innovation and technology under the sandbox scheme. Apart from used cases mentioned earlier, several businesses have expressed interest in experimenting with new products and operations while awaiting the law's enactment. The SEC Thailand, however, expects that the number of participants will expand in the future.

CONCLUSION

The SEC Thailand encourages the use of technology, recognising the need for digital transformation and the integration of new technologies in the capital market. As technologies have become integral to business operations and investors' preferences, the DSE was introduced with the expectation of improving operational process — particularly by enhancing time efficiency, reducing costs and providing convenient access for investors. In addition, technologies strengthen supervisory capacity in the capital market. Leveraging technology in supervision can builds trust and maximises prevention of risks in the market, thereby advancing the SEC Thailand's objectives of enhancing financial inclusion and reinforcing trust and confidence in Thailand's capital market.

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