UNISEARCH JOURNAL

Vol. 9 No. 2 May - August 2022

New Economy

ISSN 2465-3764

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Editor's Note

The "New Economy" is an important cog driver for Thailand's economic resilience to the everchanging global economy and emerging trends in Thai society and lifestyles. The new economy is driven by knowledge, innovation, technology and creativity and operates on environmental and social sustainability principles as well as economic. Thailand's economy is expected to benefit from on effective and high-capacity infrastructure to serve its production base efficiently. To boost the country's economic health, Thailand will need to harness additional forms of capital- social and cultural capital, natural resources and biodiversity capital as well as 'local wisdom' capital.

This divergence from an exclusive focus on financial capital will require a paradigm shift to transition from the traditional economy to the new model. New types of capacity will be needed to build supportive systems to nurture innovation and research. 'Home-grown' technology development will be needed in areas such as digital platforms and informatics, and new skillsets and business models will be needed among businesses and in the labour market. The breadth of this challenge will necessitate cooperation across sectors and between public and private actors and communities to co-create a supportive ecosystem for the new economy, in which each individual can contribute according to their own specific roles, capacities and skills. Government, the businesses community, educational institutions. and the public all need to join hands in this endeavour if Thailand is to achieve balanced and sustainable development.

Editorial Board

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UNISEARCH JOURNAL

Vol. 9 No. 2 May - August 2022

Published by
- Chula Unisearch, Chulalongkorn University

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Content

Vol. 9 No. 2 (May. - Aug. 2022)

Article

Urbanites 4.0: The Futures of Work for Thai Urban Life

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Introduction

Urbanization often emerges as central places of commerce and economic activities with high density of population serving as both laborers and consumers. Such phenomenon also raises the number of jobs and income opportunities, which further attracts other people migrating from spaces beyond the bounds of urbanity. With higher population density, urban complexity also grows. The accumulative disposable income raised by levels of productivity of urbanites also further stimulate demands for more diverse services to support business efficiency and accommodate different lifestyles (Moretti, 2013). Furthermore, cities with these accommodating services will also attract other businesses and investment, creating reinforcing loop for urban economic development. Conversely, cities with weaker economic foundations often do not have the means to support such advanced services and can lose their competitiveness to attract investment and prospective migrants. Ultimately, people may leave and abandon their cities and let cities shrink economically, socially, as well as spatially. Thus, work opportunities and jobs creation are just as important for the wellbeing of cities as well as they are for individuals. In other words, urbanization and work are highly interrelated.

The dynamics between demographic patterns and job-seeking migration posit that the futures of cities are also reliant upon the futures of work, and vice versa. Thus, this research study focuses on changing trends of the service jobs, especially with the recent emergence of platform and gig economy, of which are highly concentrated in the Bangkok Metropolitan Area (BMA) and have the potential to change the urban dynamics in the futures as well. This new economic dynamic and the becoming digital age in Thailand variably affect diverse groups of people through the lenses of labor markets, working lifestyles, as well as functionalities of urban spaces. While the integration of technology and development of new business models for the digital age following the Thailand 4.0 framework can encourage innovation and investment in globally competitive businesses, wider technology and digital divide will further exacerbates inequality within the BMA. Holistic and inclusive social and economic policies are important tools to ease this transition and to mitigate the propagation of inequality. In other words, policies related to the futures of work and cities need to respond to both technology mavericks and laggards alike in order to create more just and more equitable urban futures.

This research uses strategic foresight as its main methodology. The scope of this research focuses on the futures of service work within the next 20 years. While the full report of this research comprises of many other aspects and processes, this article will focus on describing the baseline future and its related policy recommendations.

Conclusion and recommendations

This research study looks at how the futures of work will impact BMA in the futures scenarios. Such impacts encompass labor dynamics through the lens of the labor economy as well as labors' lifestyles. As lifestyles of urbanites change, the roles and functionalities of BMA also need to be changed as well. This study stresses that the relationship between work, people (as workers), and cities (as places of work) cannot be separated from each other. Understanding the plausible futures scenarios of the BMA that are based on these dynamic relationships can help enrich strategic development dialogues to become more comprehensive, holistic, and future-ready as well.

Article

Defining and Delineating Urban Areas in Thailand

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Introduction

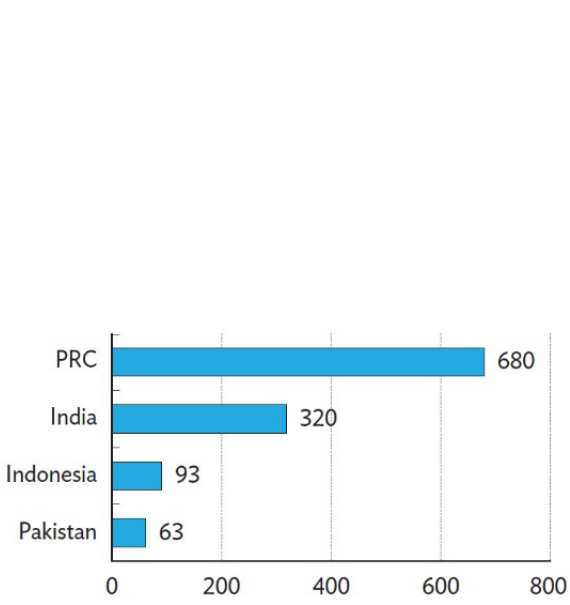
Urbanization is accelerating at a rapid pace around the world, especially in developing countries. However, this shift is not necessarily accompanied by improvements in quality of life. The pace and scale of urbanization also causes multiple challenges for town planners and municipal governments.

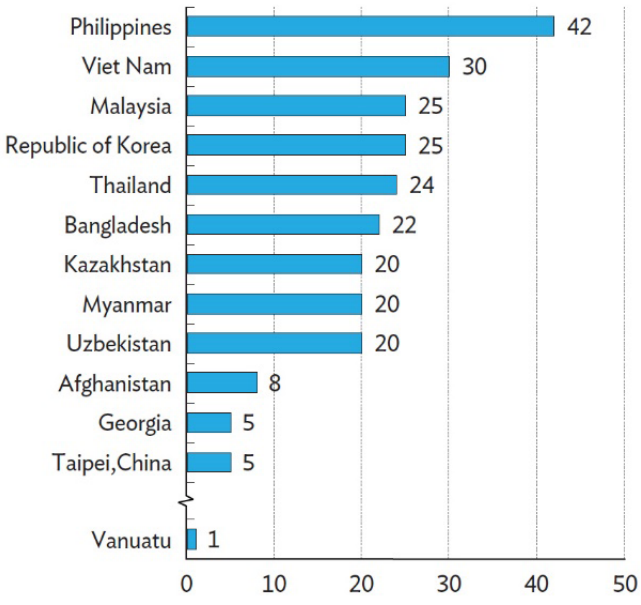
Denser urban populations and increased incomes are driving higher consumption of resources per capita. Moreover, pressure on housing and the physical and social infrastructure within large cities has become unrelenting. In developing countries, unregulated urbanization significantly contributes to inefficient resource consumption and land use. These new urban landscapes will be very difficult to resolve in the future.

Urbanization also impacts on peri-urban areas (areas adjacent to urban areas), resulting in rapid and widespread changes in land use, infrastructure, utilities, and social structures. Lack of spatial planning and regulations can bring serious impacts from urbanization, including loss of agricultural land and nature reserves resulting from real estate development and use of peri-urban areas for disposal of municipal wastes via unregulated landfills or even open dumping.

Increasing population mobility also exacerbates existing urban problems such as traffic congestion, environmental issues, pollution and waste management, resulting in dramatic strains on town planning, development, and urban administration. This is because the demographic data for planning and administration are usually updated once a year or even 10 years for the census. Therefore, these processes are not equipped to deal with the rapid demographic changes they are today experiencing. Demographic data is merely an example of data inadequacy for effective urban planning, development, and administration.

The rapid dynamic of cities, together with a lack of data and inefficient urban data, including current and historic data, and spatial data necessary for effective planning and management, presents major challenges for local governments across the country. This is particularly the case when urbanization goes beyond administrative boundaries, which are crucial for collaborative planning and administration for relevant administrative organizations.





Article

Investigating Consumer Behaviors towards the Development of a Business Model for Plastic Waste Management in Inner Bangkok (Pathum Wan District) Using the Circular Economy Concept

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Introduction

In 2019, Thailand generated approximately 28.71 million tons of solid waste, and this amount tends to increase due to several factors. However, the proportion of waste properly handled is falling since a number of integrated waste management facilities nearly reach their maximum capacity, and some of them are operated ineffectively. These issues result in environmental and public health impacts. Therefore, government agencies have been promoting waste management policies, particularly for plastic wastes and marine debris, addressing the problem from upstream, midstream, to downstream levels. For example, the operation plan for plastic waste management: phase I (2020 – 2022) aims to recycle at least 50 percent of plastic waste through the circular economy system by 2022. In Thailand, it was estimated that plastic packaging waste had been generated up to 1.85 millon tons in 2019. Based on this amount, the plastic waste of 1.49 million tons were collected and managed by local administrations while only 0.36 million tons or 19 percent of them were recycled.

This study entitled *"Investigating Consumer Behaviors towards the Development of a Business Model for Plastic Waste Management in Inner Bangkok (Pathum Wan District) Using the Circular Economy Concept"* was conducted to develop a business plan for effective plastic waste recycling and to propose a potential model for plastic waste collection. The study area covered the central retail businesses of Thailand, consisting of three major department stores: Siam Paragon, Siam Center, and Siam Discovery. The findings from this research will raise public awareness on the growing plastic waste crisis as well as promote the sustainable management of used plastics according to the circular economy concept. As shown in Figure 1, sorting and recycling used plastics as raw materials would elevate the resource effiency throughout the value chain. Moreover, waste generation and greenhouse gas emission can be minimized.

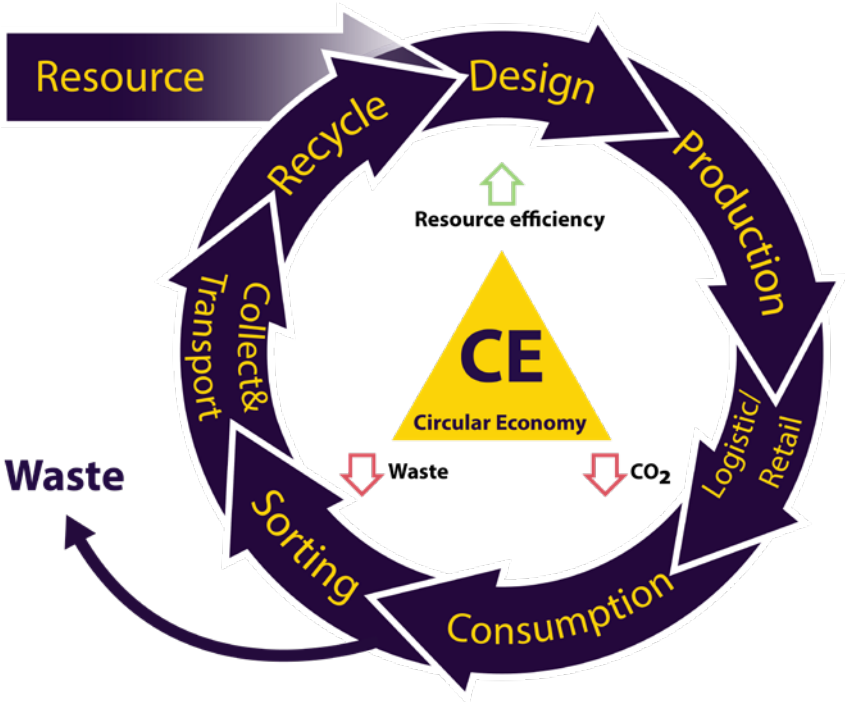

Figure 1 Circular Economy

It should be noted that source separation plays a key role in enhancing the proportion of plastic waste to be recycled. Thus, it is necessary to investigate consumers' behavior and ways toward their behavioral changes. The demand of stakeholders e.g., sorting, baling and recycling businesses must also be taken into account. Additionally, relevant data should be collected and analyzed to develop a business model for increasing plastic waste recycling rate and preventing environmental contamination caused by plastics. The overall framework of this research is illustrated in Figure 2.

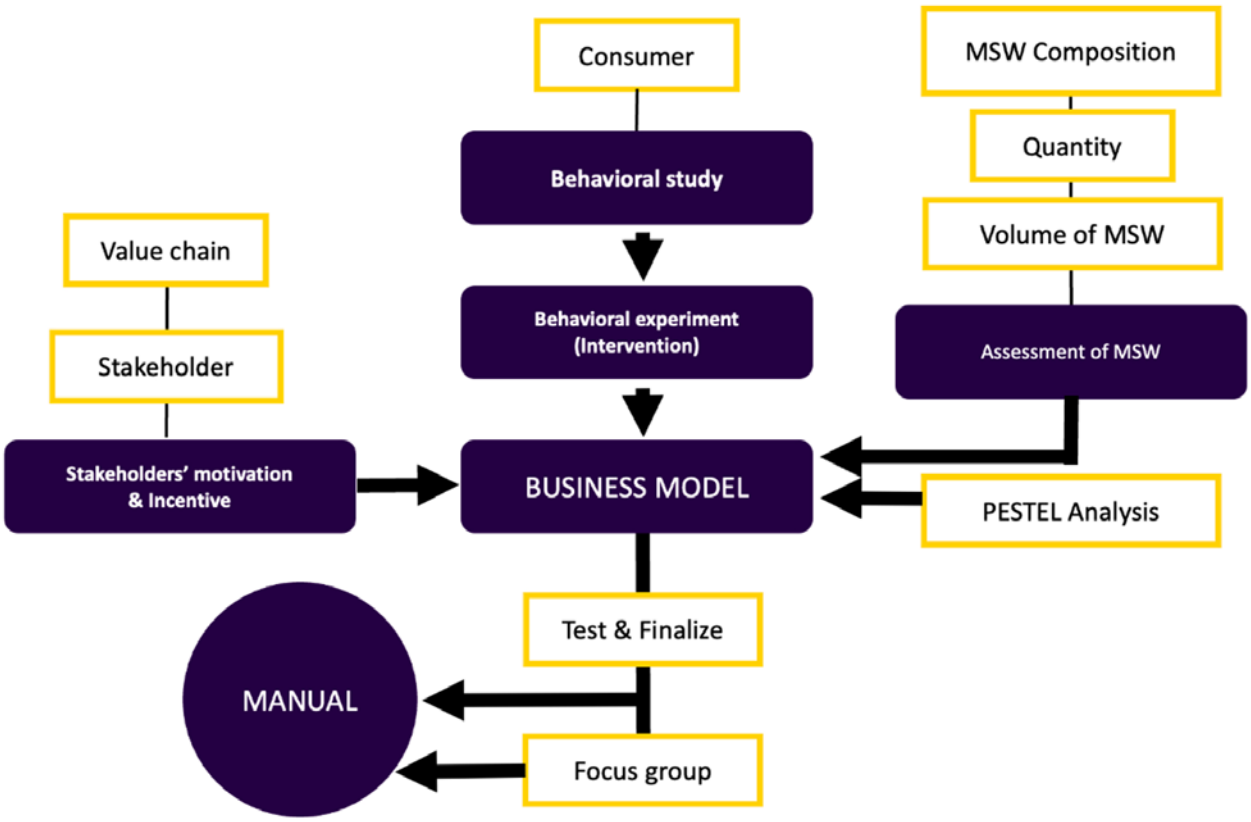

Figure 2 The overall framework of this research

Conclusion and suggestions

This research aims to develop a business plan for the efficient recycling of used plastics as well as to propose a model for effective plastic waste collection. Another purpose is to raise social awareness on plastic waste issues, which could promote a sustainable schemes for plastic waste management based upon the circular economy principles. A crucial step for increasing the proportion of plastic waste recycled is upstream sorting. Therefore, understanding consumers' behaviors and factors influencing their behavioral patterns (e.g., socio-demographic data) is important. These results would be beneficial for designing effective interventions toward the desirable consumers' behavioral changes and plastic waste recycling performance.

Scenario Foresight to Surmise Thailand's Digital Economy

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Introduction

Scenario planning is one of many tools used in futures (foresight) research. Such scenarios imagine a future based on a set of defined assumptions, trends and drivers, including social, technological, cultural and political drivers.

The objectives of this research is twofold:

1) To study guidelines and conduct a scenario planning to forecast the prospects for Thailand's digital economy.
2) To review current efforts to promote Thailand's digital economy including possible reform of Thailand's Digital Development Policy in anticipation of potential challenges to be identified during the scenario planning process.

The overarching mission of the Office of the National Digital Economy and Society Commission (ONDE) is to define strategies and plans to empower Thailand to transform towards a digital economy and society. Scenario foresight is a crucial planning tool used to project possible alternative futures and identify actions and resources needed today to drive digital development in an optimal and predictable direction. ONDE has collaborated with **Chula Unisearch** of Chulalongkorn University to implement a scenario foresight project to project the country's future digital economy.

The study began with a literature review, reviewing 5 country case studies on conducting scenario foresight for development of the digital economy, brainstorming for the consultant team, meetings with executives and counterpart staff of ONDE, discussion with 21 specialized agencies and participation in relevant activities. Finally, the research team organized three brainstorming sessions to gather ideas and suggestions from 156 stakeholder representatives.

The project was implemented from 15 May – 9 December 2020 with a 10-year forecasting horizon for the scenario foresight (2021-2030). The scenario foresight was based on three themes: 1) Platform Economy 2) Silver Economy and 3) Stay-at-Home Economy.

IDEs Investment Ecosystem: Accelerating Thailand Scaleup Nation 2030

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Introduction

A reform of Thailand's research and innovation system is required to driving the economy country to achieve the goal of the Thailand 4.0 strategy, whose vision is: "Thailand is stable, prosperous, and sustainable, a developed country adhering to the Sufficiency Economy philosophy". Thailand 4.0 aims to strengthen the economy by enhancing the country's competitiveness and social development, as well as improving people's quality of life in accordance with the policies and strategies of higher education, science, research and innovation, 2020–2027, which have established objectives and goals to develop an innovative economy for sustainable success.

Innovation-Driven Enterprises (IDEs) have the potential to grow exponentially and sustainably. To foster IDEs in Thailand it will be necessary to update legal and regulatory frameworks and to develop measures and incentives including streamlined government services, to remove barriers to trade and investment in R&D and create additional incentives for innovative business practices.

An investment ecosystem with adequate funding sources, efficient and flexible mechanisms to support activities will be crucial to fostering emergence and long-term sustainability of innovation-based businesses. It increases the value of the business at each stage of its development and broadening the customer base to the global market. However, the Thai venture capital ecosystem requires further development, from policy to implementation. In terms of policy design, there is still a scarcity of empirical data and analytics on both supply and demand, even on basis data such as the number and potential of innovative base entrepreneurs, as well as the number, type, interest, and potential of investors, range of investment and technological fields or industries with high prospects and investment opportunities in Thailand.

Conclusion and recommendations

According to the findings of a study of Thailand's innovation-based businesses from 2000 to 2021, Thailand still needs to strengthen its investment ecosystem in order to drive growth and scale-up and boost GDP. Despite numerous challenges, new opportunities are also emerging, for example to develop a joint investment ecosystem that meets the needs of key stakeholders while reducing risks, or the formation of a university holding company. Most importantly, the country needs to enact policies to accelerate Thailand's transformation from a start-up country to a scale-up country by 2030 through collaboration among government, the private sector and universities on a path to support entrepreneurs in Thailand following three strategies: Talent Management Strategy, Scale Up with Ease of Doing Strategy, and Risk-Worthy Return on Investment Strategy (Funding availability).

A strong innovation investment ecosystem is required to support transformation of startups to reach scale and long term sustainability as mature businesses. A global mindset and ambition, a collaborative culture, and an enabling regulatory environment will be key to success, as well as the flexibility and agility to adapt to fast-changing lifestyles. Thai people's smiles and happiness will undoubtedly be accompanied by a bright future.

A New-era Economy Based on a New Way of Life

This UNISEARCH JOURNAL is honoured to present the unique perspectives of three of Thailand's economic gurus: Associate Professor Chayodom Sabhasri, Ph.D., Associate Professor Piti Srisangnam, Ph.D., and Assistant Professor Pongsak Luangaram, Ph.D., from the Faculty of Economics, Chulalongkorn University. Here they share their world vision and views on the new-era economy based on a fast-changing new way of life.

Economic development – Thailand's and the world

"...The development of the Thai economy does not occur independently, but has always been linked with global politics and international economy..."

Assist. Prof. Pongsak: Historically, Thailand's economic development can be divided into four phases, with the emergence of a new-era economy tracing back to the early post-World War II years. Since the 1090s, Thailand has transformed, and in 1976 the country's economy had advanced due to strong economic planning, leading to the country's redesignation from a low-income to a middle-income country. Over the past 60 years, per capita income has risen to approximately 230,000-240,000 baht per year, with incomes growing three times faster than growth in global per capita income- a significant achievement indeed.

However, after 1976, the economy began to stagnate, falling into the middle-income trap despite significant structural changes initiated back in the early 1960s. However, this is changing as agricultural GDP has since fallen from 30 per cent to 9 per cent of total GDP, while industry's share has risen from 12 per cent to 25 per cent of GDP and 12 per cent in the service sector, including tourism. Export earnings are very important to Thailand's economy, growing from only 16 per cent of GDP in 1960 to 65 per cent of GDP today. Nevertheless, these remarkable accomplishments have so far not been sufficient to enable Thailand to escape from the middle-income trap. Clearly, with such dependence on export earnings, Thailand's economy is closely interlinked and dependent on global politics and the international economy, and its fortunes have generally mirrored global cycles of growth and stagnation over the past 50 years.

The USA emerged from World War II with relatively minor economic damage compared with its European counterparts and thereafter transformed into a new political and economic superpower. The Bretton Woods Agreement at the United Nations Monetary and Financial Conference in 1944 set the stage for the USA to set the global political as well as the economic agenda. As a result, the US dollar was tied to the gold standard to bolster credibility in the international financial system and stabilise the currency not only of the US dollar itself, but also of other currencies tied to the dollar. This allowed the US dollar to gradually replace Sterling as the world's primary global currency.

In addition, marking the beginning of the Cold War, the US initiated a number of steps to prevent the spread of communism, providing financial assistance to several countries for economic development, including Thailand, where the political situation was faltering. The government of Field Marshal Plaek Phibunsongkhram at the time had no choice but to accept both political and military assistance along with economic aid, despite suspicions of a hidden agenda on the part of the US. This marked the beginning of the emergence of a new era of capitalism in Thailand that was later to change Thailand's social fabric as well as its economic structure. To enhance Thailand's understanding of, and linkages with, global economic development trends, Thailand established the Office of the National Economic and Social Development Council and formulated the country's first National Economic Development Plan. The World Bank stepped in to help organise the first technocratic think-tank, led by Dr. Puey Ungphakorn. The resulting structures and focus on national economic planning have since proved effective, driving economic growth as high as 7-8 per cent p.a.

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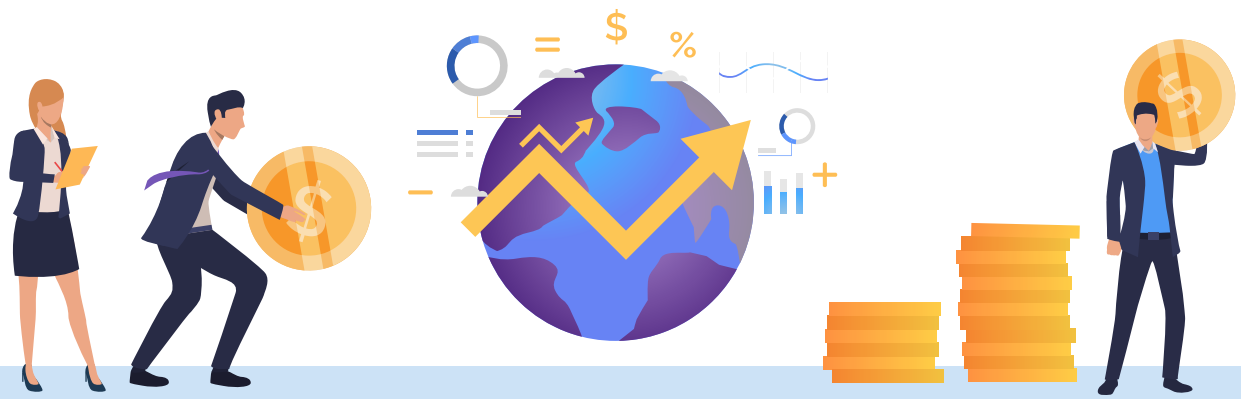
The 1970s was a turning point in Thai politics, with protests against the dictatorship leading to the events of 14 October, 1973, culminating at the end of the military dictatorship. It was also a turning point in creating room for politicians (rather than Generals) to take leadership over economic policy. The 1980s was a period throughout which Thailand enjoyed good fortune as a result of both effective planning and economic windfall. The turning points were the discovery of natural gas fields in the Gulf of Thailand, infrastructure development under the Eastern Seaboard Development Plan (ESDP) as well as the relocation of the Japanese production hub overseas after the appreciation of the yen from the 1985 Plaza Accord. Thailand, with the advantages of infrastructure and cheap labour at the time, benefited from foreign capital inflows, resulting in leapfrogging growth in the Thai economy. It was such a prosperous era, with economic expansion at the end of the decade reaching more than 10 per cent, that Thailand was regarded as an economic miracle. The policy mantra then was to 'change a battlefield into a market'. Meanwhile, with post-Cold war liberalisation of trade and finance, Thailand was expected to be the fifth tiger in Asia after Hong Kong, Singapore, South Korea, and Taiwan.

However, Thailand's promise remained unfulfilled. Unfettered economic growth led to an imbalance in the entire financial system, resulting in bubbles in the stock market and land prices caused by over-expansion. Speculation, especially in the real estate sector, led to the so-called 'Tom Yum Kung' crisis in 1997-1998. In addition, the stability value of the Thai Baht, maintained by a constant exchange rate policy that did not adjust to rapidly changing economic conditions, led to a currency crash that led to devaluation and the floating of the baht in 1997. Financial losses were immense, with many businesses unable to service foreign currency debts, and an unprecedented level of defaults and insolvencies. The crisis was instrumental in driving political reform and the writing of the 1997 Constitution or the 'People's Constitution'.

The lessons of the Tom Yum Kung crisis underscored the importance of economic risk management, which subsequently helped ensure Thailand could weather the growing global financial crisis. Thailand has adopted a transparent and verifiable monetary policy model, a flexible exchange rate system, and a strong and efficient financial institution system development plan. The depreciation of the baht is one of the factors influencing the growth of exports and the tourism sector, and has been key to Thailand's rapid economic recovery.

In 2000, the government adopted a two-pronged economic strategy- to directly stimulate grassroots economic growth as well as policy measures to improve export competitiveness. While this policy was maintained, both measures succeeded in benefitting rural people, exporters and the tourism sectors. However, the 2006 coup d'état marked a turning point, creating deep-seated political divisions that even today continue to impede all aspects of Thai society and particularly the economy. This event underscores the fact that politics and the economy are inseparable. Today, global economic and political volatility poses major challenges to the Thai economy. Recent global drivers of instability have included Brexit, the trade and technology war between China and the United States, as well as domestic events: the 2011 Great Flood and the long-running political conflict that led to the 2014 coup. Crucially, Thailand is prone to sluggish economic growth due to a lack of innovation, while previous competitive advantages, such as cheap labour and natural resources, are fading away. Thailand faces an urgent and growing need to respond to emerging competitive challenges such as technological advancement, environmental change, and rebalancing international geopolitics. The period of 2022 to 2030 will test Thailand's resilience and preparedness to enter the new world context in a stable and sustainable fashion.



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Thailand's economic system, development approaches and challenges

"...Sustainable economic growth must take into account environmental issues, production structure with adequate and modern utilities, workers with the skills for the new world, education system, healthcare services that meet our needs, international relations to manage geopolitical changes, and free trade and investment to foster a thriving competitive global trade system..."

Assoc. Prof. Chayodom: We cannot simply consider the national economy in isolation, given its linkages and inter-dependencies with regional and global partners. The economy is constantly impacted by multiple external factors including political changes, production structures, trade relations, technological advancement and environmental sustainability. From the economist's perspective, a good economy is one that grows sustainably with the least level of social inequality. Its policies must be able to meet people's needs and foster well-being, health and happiness across all segments of the population. Such an economy would need to grow sustainably, in a balanced and stable manner, regardless of global economic volatility or any other unexpected event. Stability is primarily generated via domestic factors. Domestic inflation rates must be at an acceptable level for consumers and businesses. People of working age must be able to find work suitable for their skills. In the meantime, stability in international trade requires structural adjustment to ensure that exported goods align with trends in global demand, and to avoid over-reliance on imports and exports. In terms of imports, Thailand's former reliance on energy imports, including oil, natural gas and electricity, made the country especially vulnerable to spikes in global energy prices. On the export side, the country's dependence on agricultural commodities generated limited value-added, while exported industrial goods still have limited value-added, often relying on imported components. Industries were typically labour-intensive with limited levels of automation. Moreover, with tourism generating a major proportion of foreign exchange earnings, the impact of COVID on the national economy was devastating and will take some time to recover. All these factors help explain why Thailand's economy is so vulnerable to both internal and external threats.

Achieving sustainable economic growth requires a holistic approach beyond financial or economic returns. Increasingly critical are efforts to mitigate social, environmental and climate change impacts of economic activity through initiatives such as 'net zero' and 'carbon neutrality'. Sustainable growth demands a domestic manufacturing structure with adequate and modern infrastructure, a skilled workforce to keep pace with technological changes, an education system, proper healthcare and available infrastructure to service the industry cost-effectively. Thailand must continue to invest to maintain its role in international supply chains by producing goods that meet changing global demands in today's digital era. The country needs open international relations, maintain stable geopolitical ties and engage in free trade and investment agreements, including with ASEAN+6 and major trading partners around the world.

Stable economic growth requires a focus on establishing effective income structures and creating new opportunities to narrow the inequality gap. Past precedent indicates that downturns in economic prosperity, e.g. in China, India, the Netherlands, or the UK are often driven by social upheavals caused by exploitation and extreme inequity in access to resources by low-income workers. Therefore, there must be a strong drive by manufacturers and businesses as well as the government to grow their competitiveness while ensuring fair compensation in the workplace.

The term 'VUCA' (volatility, uncertainty, complexity, and ambiguity) has also been invoked to describe a perfect storm of factors driving economic trends in today's world. Russia's invasion of Ukraine and the COVID-19 pandemic represent only the most recent global shocks that have led to impacts that are uncertain, complex, and ambiguous. It is difficult to anticipate their long-term outcomes and impacts on the global economy, and so Thailand, in common with the rest of the world, needs a strong and resilient foundation to address the VUCA world.

"...It is the duty of economists to optimise the economy, not for peak output but for sustainability, to strike an optimum balance between growth, resilience, and inclusiveness..."

Assoc. Prof. Piti: To cope with the VUCA world, it is the duty of economists to strike an optimum balance between three elements: growth, resilience, and inclusiveness, at local as well as global levels. Building a bigger cake for all contributes to macro, as well as micro-economic growth and distributes income fairly to contribute to sustainability. The government must use policies, strategies and incentives to enhance Thailand's competitiveness and narrow the inequality gap by creating equal opportunities for all.

Assoc. Prof. Chayodom: The challenges within the country come from many sides. The current challenge is the widening social and income inequalities caused by unequal access to quality education, medical care, and the huge income gap between the rich and the poor. The household debt to GDP ratio has risen from more than 80 per cent a decade ago to today's levels of more than 90 per cent- the highest in history. The COVID-19 crisis has further widened this gulf. Currently, short-term solutions are being offered to allow more flexible loan repayment terms and create additional employment to generate enough income to repay debts. For longer-term solutions, economists must consider the functioning of the Bank of Thailand, commercial banking and the entire financial system to identify solutions to the burgeoning level of household debt. In the meantime, a social safety net offers temporary respite for those who have lost their jobs and income, sustains the economy and reverses the rising ratio of household debt to DGP.

To make matters worse, Thailand's ageing society is further reducing the economically active population compared with competing economies such as Vietnam, where the average age is around 35. Thailand has both a higher proportion of the elderly and a lower birth rate. This, of course, exacerbates the related challenges of labour supply and a shrinking tax base to fund healthcare and social services.

The next problem is the outlook for inflation, driven partly by the fast-growing cost of energy. Oil and gas prices have rocketed due to Russia's invasion of Ukraine, disrupting global energy supplies. As a result, alternatives such as coal and LNG have become more costly as well. With its heavy dependence on imported energy, Thailand has been severely impacted as a result. Higher costs of fertiliser (whose production is energy-intensive) have been particularly damaging, affecting food prices and farmer incomes. Clearly, the poor suffer disproportionately from such pressures compared with the rich.

The next challenge arises from the continuing and drawn-out political instability, which is hampering inward investment. Today, Vietnam offers foreign investors a better value proposition due to political stability, investment promotion policies, cost-effective and skilled labour market and modern infrastructure. The COVID-19 epidemic did not only impact fertiliser prices- it resulted in a higher cost of living, increased manufacturing costs, reduced spending power and the slowdown of all business sectors, especially construction, tourism, and dependent service industries such as transport, hotels and restaurants. Rising Non-Performance Loans (NPL) in both public and private sectors exacerbated financial risks and further disrupted financial institutions and capital markets.

As noted above, Thailand's dependence on service industries, particularly tourism, exposes the economy to a high level of vulnerability. Thailand's pre-lockdown tourism revenue represented more than 15 per cent of the total GDP, when foreign tourists reached a peak of 40 million per year. With approximately 7 million people employed by tourism-related service industries such as catering, restaurants, massage, spa, tour guides, transportation, hotels and entertainment, boosting the tourism sector is a top priority to drive post-COVID economic recovery.

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Clearly, Thailand's economy requires structural reform of its manufacturing and export sector if it is to recover its global competitiveness and achieve sustainable growth. To achieve this will necessitate investment in technological innovation and know-how to develop new products and services for the future. The middle-income trap has left the country with a shortage of both skilled and unskilled labour, and limits its capacity to attract inward investment in both labour-intensive and technology-intensive manufacturing. The country's dependence on migrant workers from neighbouring countries represents a serious handicap to building a skilled workforce suited to a knowledge-based economy, while the educational structure has yet to adjust to deliver qualified graduate and vocational professionals of the calibre and in the numbers required.

A shift to alternative energy to replace fossil fuels is also essential as a long-term strategy for economic resilience, while infrastructure development also needs to be accelerated after a gap of more than 30 years since the establishment of Map Ta Phut Industrial Estate under the leadership of P.M. General Prem Tinsulanonda. Modern infrastructure will be essential to attract and service new industries and investment, e.g. within the Eastern Economic Corridor (EEC). These interventions will be essential if Thailand is to compete and offer a comparative advantage against strong neighbouring competitors such as Vietnam and Indonesia.

The last two challenges facing Thailand's economy are the modernisation of monetary and fiscal policies. During the economic downturn, the government was forced to increase support spending during COVID-19, even as tax revenues shrank considerably. COVID-related borrowing reached 1.5 trillion baht to cover costs of medical services, public support expenses, and government projects located in the provinces to stimulate employment. These COVID-19 measures helped drive the debt-to-GDP ratio to 70 per cent, going significantly beyond the legal maximum of 60 per cent. Although the situation has since normalised, economic and fiscal restructuring will be essential to rebuild the tax base and restore the economy. The Bank of Thailand has already been forced to intervene to address ballooning household and business debt, in order to soften the impacts on financial institutions and the capital market. Though so far effective, these interventions to monetary policy face several limitations; even very low domestic interest rates are ineffective in stimulating investment as global interest rates begin to rise. Consequently, if Thailand's interest rates do not rise in line with global rates, this may affect capital outflows and the exchange rate. In contrast, increasing interest rates too soon will hamper the post-COVID recovery of the business sector through increased cost of borrowing. A careful balance must therefore be struck in terms of monetary and fiscal policy interventions in order to avoid unintended consequences.

Assoc. Prof. Piti: The international community today confronts the challenge of unprecedented global disruption, which can be divided into five key areas. The first area of disruption is technological change. Radical technological changes are already driving a transformation to a new economy that, if well-harnessed, will maximise the value of innovations in digital technology, quantum computing etc., and drive competitiveness. However, unless Thailand moves fast to equip its graduates with sufficient levels of digital literacy, instead of leading and shaping the Fourth Industrial Revolution, Thailand will revert to playing a passive role, reducing its economic competitiveness. In today's 'Cyber-world', Thailand needs to master four emerging platform technologies. The first is blockchain technology, where a computer network is used for calculation instead of using a supercomputer to address complicated problems, such as transaction records of financial institutions. The second technology is referred to as 'digital assets', which have themselves been unlocked and realised through blockchain technology. Digital assets can be used as an alternative unregulated currency to make transactions, the most well-known of which are Bitcoin and Ethereum. The third technology- the Non-Fungible Token (NFT) is a form of digital certification system to verify ownership of tradable digital assets. The fourth technology is the digital marketplace, where buyers and sellers can meet using augmented reality (AR) and virtual reality (VR), collectively known as the metaverse. Understanding and literacy in these technologies will help shape Thailand's future role in the Fourth Industrial Revolution.

The second area of disruption is digital connectivity to facilitate e-commerce. Thailand's development of connectivity in telecommunication lags behind other countries, jeopardising future competitiveness, particularly in regard to the transition to lower-cost logistics through paperless trade. Over the past five years, the volume of goods traded via Cross Border E-Commerce (CBEC) has increased significantly. Apart from Thailand's disconnected transportation infrastructure, regulatory hurdles such as restrictions to cross-border transportation agreements, trade facilitation and non-tariff measures also hinder connectivity and thus the cost-effectiveness of Thailand's supply chain logistics.

The third challenge is to navigate the global schism between China and the United States, which hampered the management of COVID-related disruptions to Global Value Chains (GVC) far more slowly than usual. Recovery from a major economic crisis typically takes approximately three years; however, the deepening geopolitical conflict between the United States and China has caused a major decoupling of the global economy, impacting the free flow of goods and services under the concept of globalisation. Thus, Thailand is increasingly hampered in its ability to purchase products, components and raw materials at competitive prices from its preferred suppliers, for domestic assembly and export of finished goods. Nations and companies may be forced to align with either China or the United States in their procurement policies. Therefore, becoming a middle chain connecting the two powers has often been strategically prudent. However, to fulfil such a role effectively, it is necessary to have 1) good domestic fundamentals to attract foreign investment, especially world-class logistics and telecommunication systems; 2) favourable international trade agreements and modern domestic regulations that can foster international trade; 3) a skilled and literate workforce with the knowledge and competencies to enable Thailand to compete with competitors such as Vietnam.

The fourth challenge is the need to incorporate environmental, social, and governance (ESG) targets into the design and implementation of the sustainable development initiative. ESG combines globally-recognised metrics addressing the three pillars of sustainable development. A diversity of approaches are available to address climate change under ESG, including programmes such as 'Net Zero Emissions' of greenhouse gases, carbon neutrality, the Bio-Circular-Green Economy (BCG Economy) and the use of the Cross-Border Adjustment Mechanism (CBAM), which allows manufacturers to purchase certificates for greenhouse gas emissions so that their products can be exported to those countries.

The fifth challenge is the social factor. In an ageing society with resulting labour shortages, Thailand still blocks qualified foreign workers from certain reserved occupations. This reduces the overall calibre of professionals entering the country, increases inequality and imposes an additional burden on social safety nets. Inequality in education and income is increasing more rapidly in Thailand than among its neighbours; Thailand's education system requires systemic reform to address these challenges.

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Economic sustainability: trends in the global and Thai economy

"...Thailand needs broad-scale legal reform to modernise education, healthcare, energy, and environmental policies while narrowing the inequality gap for a more equal society. The country should position itself within ASEAN to build a network for economic cooperation to foster economic sustainability..."

Assoc. Prof. Chayodom: Thailand's comparative advantage in its traditional export markets is constantly eroded by the rapid advances of its neighbours, who have invested in improvements in infrastructure and regulatory frameworks that facilitate investment. There will be fewer future opportunities for Thailand to be part of the international production chain. Thailand, therefore, needs widespread legal and regulatory reform to promote inward investment in manufacturing and incentivise sustainable business practices across all business sectors.

To foster economic sustainability, Thailand should urgently repeal outdated laws and replace obsolete bureaucratic processes with modern, transparent, and efficient oversight frameworks. Regulatory Impact Assessment (RIA) should be required for all proposed new regulations to minimise unintended consequences. Such reform has already been successfully implemented in countries including Korea, Vietnam and Mexico. Thailand began this journey about three years ago to address pain points for business operations and foster a stronger industrial sector, including incentives for new industries and closing the economic gap to return to sustainable growth.

Upskilling the country's workforce to meet future needs is being addressed via an approach to education called STEM, which integrates knowledge in key scientific domains that are fundamental to the country's future development. By promoting four disciplines (science, technology, engineering, and mathematics), STEM is promoted from middle school through to the university level, where it is implemented under the Re-inventing University Project. This development aims to align and integrate the programmes of the Ministry of Education and the Ministry of Higher Education, Science, Research, and Innovation.

At a geopolitical level, the impact of deglobalisation due to the conflict between the USA and China gives a further imperative for the ASEAN community to take a leading role in this new-era economy.

The new economy and its significance for national development

"...Thailand should take the lead role in ASEAN's geopolitical positioning to establish a counterpoint to the global superpowers..."

Assoc. Prof. Piti: As previously discussed, deglobalisation is gaining pace with the deepening of the conflict between the USA and China. China has expanded its economic sphere of influence while the US, with its smaller economy, is making allies to jointly counter China's economic power. As a consequence, the decisions of many countries were made based on national security rather than economic reasons. Furthermore, the Indo-Pacific policy used by the United States to encircle China has further extended the conflict frontline to ASEAN and South Asia, with Thailand right in the middle. These geopolitical issues can only be addressed from a regional rather than a national perspective to present a unified approach. One benefit of regional integration under ASEAN could be to redress the imbalance in labour supply across the region and lower overall costs. Thailand has an opportunity to take a leadership role within the ASEAN community to build the bloc's bargaining power with other powerful nations.

Partnerships outside ASEAN are also important. For example, the Regional Comprehensive Economic Partnership (RCEP), including 10 ASEAN countries, China, Japan, Korea, Australia, and New Zealand, will create the largest and most complete Free Trade Area (FTA). The RCEP will make Thailand the hub for addressing economic decoupling. In the meantime, further afield, the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) carries significant influence and potential as a regional bloc. This cooperation includes Thailand, Myanmar, India, Sri Lanka, Bangladesh, Nepal, and Bhutan, with a total market size of 1.7 billion people and an economic value of 4.4 trillion USD, the 4th largest in the world. BIMSTEC alliance represents the expansion of economic markets to the east and the west, with Thailand at the very centre of the Indo-pacific Region where China aspires to extend its economic influence.

In line with global trends, Thailand needs to adopt a more regional perspective if it is to cement its position as a regional economic and political powerhouse. The country needs to think outside the box, invest in its workforce, infrastructure and regulatory framework and find sustainable and equitable solutions to drive long-term competitiveness.

ASEAN is particularly important. Over the course of development, it contributes to greater collective bargaining power and reinforces Thailand's economic strengths. Since its establishment on 8 August 1967 (originally as the ASEAN Free Trade Area, or AFTA), the country has played a leadership role, proposing liberation of the service industry under the Bangkok Declaration, expansion of the security cooperation framework, the ASEAN Regional Forum, integration and vision making during the Asian financial crisis that led to the formal establishment of the ASEAN Economic Community, the ASEAN Political-Security Community, ASEAN Socio-Cultural Community, and ASEAN Vision. In addition, Thailand also drove the Master Plan on ASEAN Connectivity (MPAC), the ASEAN Charter, which is the equivalent of a Constitution for ASEAN on human rights protection, the ASEAN Outlook on the Indo-Pacific (AOIP) in choosing the position of ASEAN amidst the conflicts between the United States and China and determining ASEAN as the core in implementing policies that create connectivity in the Indo-Pacific Region. Therefore, if Thailand can continue to play an effective leadership role in ASEAN, it will be able to address its weaknesses and reinforce its strengths.

Assist. Prof. Pongsak: Even though the economic structure of Thailand is heavily dependent on foreign countries, with tourism and expert industries as the main pillar, Thailand's financial structure remains robust. Regarding the financial landscape for the digital economy and sustainable development, the changing point is e-payment or Prompt Pay, which increasingly impacts everyone. The growth of e-commerce and related logistics businesses has proven that a strong cashless financial structure can facilitate economic activities, trade and cultural connections. There are three levels of digital currency development. First, digital currencies are used between financial institutions, such as inter-bank transactions. Thailand is one of the first countries to implement this system. The second level is to use digital currencies at the business level (wholesale digital currency). The last one is to enable public use of digital currencies (retail digital currency), also known as programmable money. The coming years will be critical to assess the impacts of digital currency systems, e.g. on financial innovation or financial inclusion.

A sound, transparent and trusted financial framework is crucial for economic development. Currently, the Bank of Thailand supports establishing virtual banks that can fully operate commercial banking activities. Entrepreneurs can now open a digital bank account with no branches to foster competitiveness. Such financial innovations can enhance access to banking and other financial services and thus reduce financial inequality. Particularly within an ageing population, it is clear that financial technologies and pipeline innovations currently under development have significant potential to drive future economic growth.

In my opinion, the new economy is one in which the private sector plays a leading role in economic activities instead of the state sector working as the planner. Thailand has embraced technological development in the financial system; though already well advanced, it will continue to innovate and grow. The COVID-19 pandemic also accelerated the adoption of new technologies that were deemed essential to the government's efforts to support those affected, particularly the underprivileged or elderly people. Education clearly needs to be urgently reformed, while technological advancement still requires continuing support in terms of research and development to increase productivity. Meanwhile, the private sector should concentrate on digital transformation and a reformed regulatory environment to reduce inefficiencies and promote global competitiveness in the digital economy.

Problems, obstacles, and limitations in entering the new economy

"...Politics and the economy go hand in hand. Crucially, the impact of political instability is evident in the Thai economy too. Technology has driven the establishment of a new equilibrium in international geopolitics, and Thailand must adapt to thrive..."

Assist. Prof. Pongsak: As is evident from the case of Thailand's economic development, politics and the economy go hand in hand. Crucially, the impact of political instability is evident in the Thai economy too. Technology has driven the establishment of a new equilibrium in international geopolitics, and Thailand must adapt to thrive. The key constraints and challenges to Thailand's economic competitiveness have already been described, but include dwindling natural gas reserves, heavy dependence on exports and tourism, a cumbersome regulatory environment concerning foreign investment, as well as endemic corruption. These structural problems create four traps for Thailand's economy: middle income, heavy reliance on foreign countries, debt, and inequality. Four actions are required during the forthcoming phase of the country's economic development. First, Thailand should improve its effectiveness and efficiency in production, education, and technology. More budget should be allocated for research and development (R&D) by both the government and by businesses and industry. Secondly, Thailand must increase its self-reliance to lessen the foreign dependence trap. Thirdly, Thailand should reach sustainability in various dimensions, particularly in regard to the environment. Without eco-friendly businesses, Thailand's unique and diverse natural beauty will soon be lost forever. Lastly, the country must act to reduce social, political, and economic inequality across the country.

Assoc. Prof. Chayodom: The world has become increasingly interconnected, including the emergence of increasingly long and complex global supply chains. International relations have become increasingly sensitive and require significantly more effort to maintain harmony in political and trading relationships.

The role of educational institutions in preparing for the new economy

"...Universities should focus on multidisciplinary approaches that can generate knowledge relevant to real-world industry applications, as well as fostering equality in education and embracing lifelong learning..."

Assoc. Prof. Piti: Universities are sources of knowledge in diverse disciplines, and inter-disciplinary research has never become more important, nor more exciting. It is, therefore, crucial that university faculties work together to cross-fertilise and place more emphasis on multidisciplinary research on tangible, real-world industry needs, rather than theory. This maximises the value of resources available within universities by promoting new knowledge and innovation through technology convergence. Such an approach will benefit the universities themselves as well as businesses and society. Adopting an applied research approach relevant to real-world problems is likely to attract significantly higher budgetary support than pure, abstract research topics whose applications may not be readily apparent in the short term.

Assoc. Prof. Chayodom: The concept of ICU (Industry, Community, and University) should be developed in parallel. Knowledge from universities should be practical and relevant to the needs of the private sector as well as local communities and society at large. With expertise in a full range of disciplines in the sciences and arts today available at Chulalongkorn and other top Thai universities, the challenge lies in the effectiveness of integration and collaboration at both faculty and university level. Creating and applying knowledge should be prioritised and incentivised ahead of academic publications. Moreover, to unlock wider opportunities for advancement. Chulalongkorn University should establish an opportunity for non-registered students wishing to further their education regardless of age, e.g. via a study platform for non-registered students.

Additionally, universities should not simply rely on government grants for R&D; academics should also be expected to seek complementary co-funding from private sector sources too, e.g. to support investment in startups, innovation centres, or businesses in which the university itself functions as the entrepreneur. In the future, earning income through the intellectual property will become increasingly important. Most importantly, strong, well-funded universities are needed as the fundamental basis for national progress, economically and in all other dimensions too. Therefore, it is important to seek cooperation from, and collaboration with, civil society, the business sector and other stakeholders to ensure their continuing relevance and cost-effectiveness.

Assist. Prof. Pongsak: The primary roles of educational institutions are research and teaching. Most importantly, a university education cultivates an inquiring mind that is ready to learn, adapt and innovate, based on existing knowledge. University faculties, therefore, carry responsibility as guides and mentors for their students, to help channel their choices to their aptitudes and aspirations.

Assoc. Prof. Chayodom: In summary, universities should set three key goals. First, a multidisciplinary approach is crucial. Second, universities should focus on developing critical thinking skills (learning how to learn). Third, universities should instil ethics, morality, and appropriate roles as both leaders and followers in society.

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Many people may wonder what do often-heard terms such as 'New Economy', 'New Economy', and 'Digital Economy' really mean? How can they be easily defined and explained to non-economists? In 2000, the Fiscal Policy Office, Ministry of Commerce, defined 'New Economy' as an economic system that relies on knowledge and ideas. New ideas and technological innovation are key factors in creating new products and services, and boosting living standards. Alternatively, the same term could equally be used to refer to an economy under threat, driven by uncertain external factors. The term 'Digital Eeconomy' is most widely interpreted as an economic system using communication and information technology, e-commerce, software and services delivered digitally and embedded in and across organizations. A related term, the 'Knowledge-based Economy' refers to an economy in which productivity depends on the application of knowledge (frequently associated with, or driven by, the harnessing of 'big data' and artificial intelligence) to create competitive advantage. The term 'Information Economy' carries a slightly different connotation, referring to the emergence of commerce relating to information-related goods and services, 'including publications, entertainment, research, law, insurance and teaching in all forms' (National Electronics and Computer Technology Center, 2021).

In 2017, the National Science and Technology Development Agency (NSTDA) offered a more specific definition of 'New Economy' as an economy driven by innovation, technology, and creativity, taking into account both social and environmental sustainability in order to upgrade the country's development from its role as a contract manufacturing base to a country that has the ability to develop its own innovative products and services based on indigenous R&D capacity and investment. By harnessing the country's comparative advantages, including social and cultural capital, natural resources, and local wisdom capital, the potential of the country's economic system can be enhanced. NSTDA proposed economic reforms in five economic spheres: the digital economy, bioeconomy, creative and cultural economy, social economy, and silver economy.

ที่มา : คณะอนุกรรมาธิการขับเคลื่อนการปฏิรูปเศรษฐกิจกระแสใหม่ สภาขับเคลื่อนการปฏิรูปประเทศ, ๒๕๕๙

Source: National Science and Technology Development Agency (NSTDA) (2017)

The Ministry of Digital Economy and Society has prepared a Digital Economy Promotion Master Plan (2018–2022), with a vision for driving Thailand defined as 'Towards a dynamic digital economy on the basis of a society that has awareness, literacy, and manpower that can adapt and create opportunities from technology and digital innovations.' The Master Plan sets out to develop manpower, upgrade the economic sector to a digital economy, drive a community-level transformation towards a digital society, and develop essential infrastructure to support digital innovation. Goals have been set to develop seven 'Smart Cities' in key economic zones across the country and promote utilization of big data and digital innovation which will have a transformative role in Thailand's future economy and society.

Today, most people still care about what changes the modern economy will bring to their daily lives. New generations (Gen X or Gen Y) who have grown up in the digital age are already attuned to the tenets of a digital society. However, the older generation generally have lower levels of digital literacy and typically encounter challenges in keeping pace with its fast-changing evolution. As a result, technology avoidance is common in this age group, who are likely to suffer major challenges and disadvantage in participating and benefitting fully from a truly digital society.

The COVID-19 pandemic has in no small measure propelled many people, driven by necessity, into the online world- whether for work, social interactions or shopping. The online world itself has responded rapidly too- with new and improved technologies for remote working etc. The imperative has driven adoption by many who would not otherwise have contemplated a digital approach, even if they need help from their grandchildren to order their shopping online. Education has perhaps been the most radically changed area in our daily lives. Closure of schools and a study-from-home policy presented major challenges for students, teachers and parents alike in adjusting to the new modality. However, the experience over the past two years has proved to be successful despite challenges in developing appropriate learning platforms and pedagogy, ensuring fast and stable internet connections, and in enhancing the understanding and embrace of students, parents, and teachers to new study methods. Lesssons have also been learned in recognizing the shortcomings of remote learning- maintaining student concentration as well as finding ways to compensate for the lack of opportunity to develop face-to-face social skills that are so vital to a harmonious, functioning community and society.

An evident, dramatic, and rapid change is also notable in finance and banking. Bank branches are today closing as a result of the explosion of online banking via smartphones. Moreover, many stores and businesses, both large and small, are favouring cashless payments to avoid handling cash (both for convenience and to minimize the spread of COVID-19). This change has made many financial transactions much easier and faster.

Interest in modern technology has been greatly boosted as a result of these social trends, and manifests itself in market segmentation. For example, stock investors can be categorized into tech-savy and traditional companies. In particular, stocks in new economy industries attract investment by companies offering new products or services that serve the lifestyle of modern consumers who are attracted to technology and innovation, such as Facebook, Google, Apple, and Microsoft. In contrast, stocks in the old economy attract investment by traditional blue-chip companies in sectors such as banking, insurance, retail, and heavy industries such as energy and extractives. Technological advances have driven a remarkable acceleration in growth of 'new economy' businesses, especially during the COVID pandemic.

While social change and new trends in technology adoption evolve organically in response to market drivers, policy formulation is nevertheless fundamentally important as a basis for coherent reform towards a modern, efficient economy that is globally competitive. COVID-19 has delivered a harsh reality check, making it clear that urgent 'rewiring' is necessitated to enable Thailand's economy to adapt and transform. New Economy activities prioritized by the Reform Committee will need to provide basic knowledge in order to enhance understanding across all social groups and generations on how technology can be applied and adapted to enhance and enrich our daily lives. Action will therefore need to be coordinated across all responsible agencies as well as the private sector, while closely involving impacted communities and stakeholders from the outset. These activities include providing information, news, and knowledge to enhance awareness of online fraud and how to block opportunities for scammers. These processes together will contribute to the transition of Thailand's economy to embrace 'New Economy' thinking and compete in a fast-changing global context.

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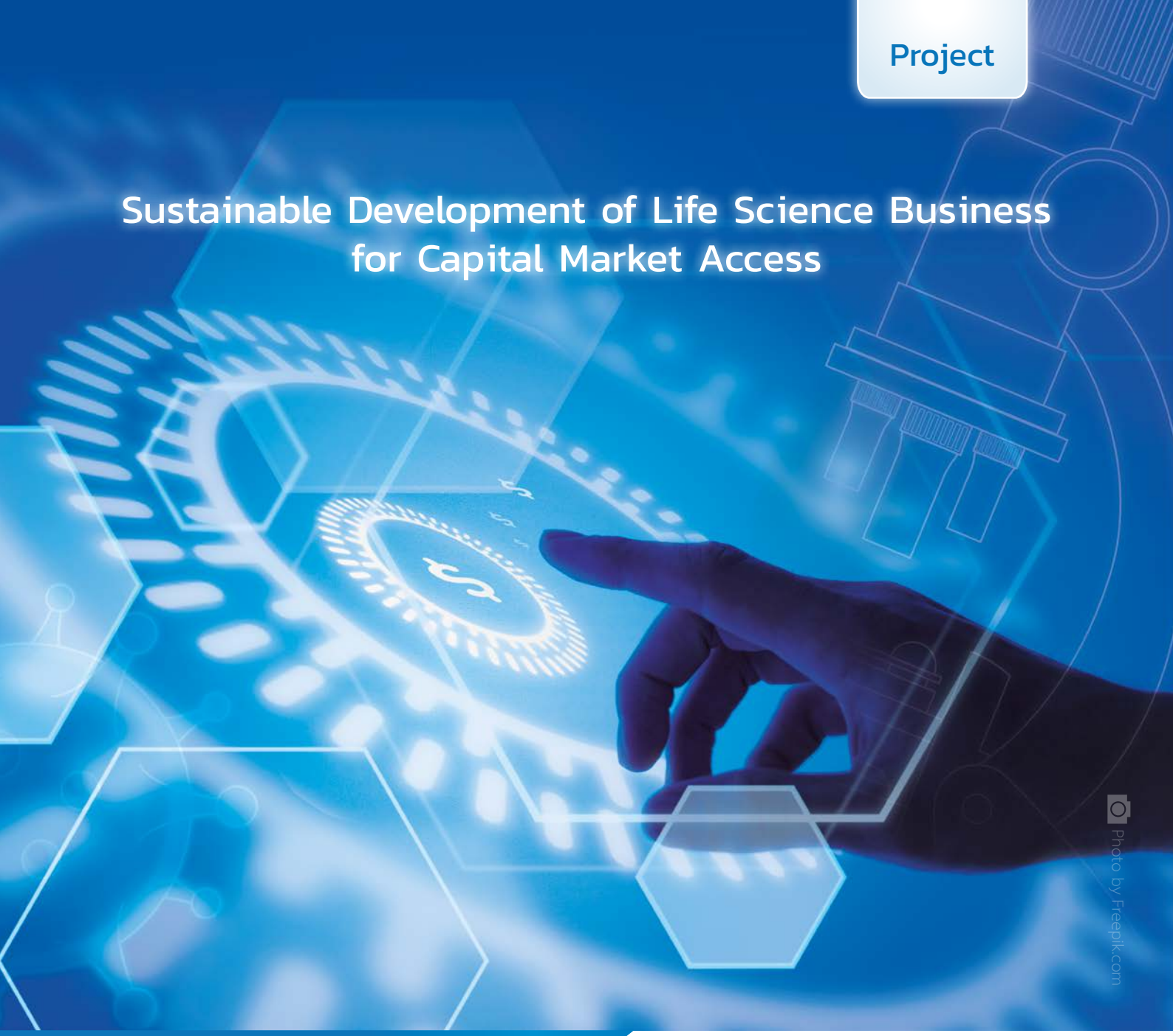
Sustainable Development of Life Science Business for Capital Market Access



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The Thai life sciences industry has always enjoyed rapid market growth and has the potential to grow further as key driver of Thailand's economic growth. The collaboration among industry players is necessary factor to the growth of the life sciences industry due to their complexity of products, services, and ecosystem that often leverage technology to unlock new business opportunities and services. As a result, networking is an important aspect of business development, especially, with experienced investors and venture capitalists, as key source of capital for business development. Therefore, organizing activities to empower Thai life science entrepreneurs to enter the capital market is important to strengthening the sector and providing a stable basis for long-term growth.

Recognizing the significance of such support, the Industrial and Investment Strategy Department of the Thailand Center of Excellence in Life Sciences (Public Organization) (TCELS) and NESDB appointed **Chula Unisearch** to manage the project ***"Developing Life Science Entrepreneurs for Sustainable Access to Capital Market".*** The project main objective was to organized activities to mentor and supported life science entrepreneurs to enter the capital market, unlocking the opportunity for business growth and development to regional and international level. The project also helped businesses to build and leverage their networks to bring together to match with potential business partners, investors and value chain actors in the life sciences industry.

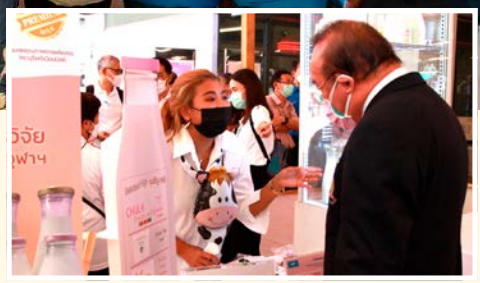
The project scope of work started with develop the measurement of entrepreneur's capabilities and plan to further develop their technology. Then, in collaboration with the TCELS public relations team, entrepreneurs were selected to participate in the project. The project team gathered and analyzed Thailand's life sciences industry, conduct workshop to improve readiness in life science business that suitable for entrepreneurs in program, such as healthcare life sciences foresight, technology readiness improvement, commercial readiness, technology assessment and collaboration with Thailand and overseas. The development of manufacturing technology, standard, regulation, including upgrading to international standards. The team developed monitoring and evaluation program to follow up with the development and participation periodically. The entrepreneurs reports development progress as planned which the team provides consultation and revision monthly. Quarterly progress report and comprehensive final report will be provided.

The project team has divided the study into six phases as follows:

- Phase 1 Create a detailed action plan for the duration of the project (Inception report)
- Phase 2
  - (Part 1) Develop life science entrepreneurs, gather and analyze current events in the life sciences
  - (Part 2) Develop life science entrepreneurship, prepare healthcare life sciences foresight and technological readiness, increase intellectual property technology, readiness evaluation and collaboration within the country/abroad
- Phase 3 Project implementation: develop technology entrepreneurs manufacturing/legal standards and international standards
- Phase 4 Develop periodic monitoring, evaluation, and development cooperation by allowing entrepreneurs to submit development results, followed up and given monthly advice by a project team
- Phase 5 Carry out planned activities and monitor the progress of domestic/international cooperation and development in various fields.
- Phase 6 Prepare a summary of operating results for the project's Final Report.

The project team anticipates that the project will help prepare life science business entrepreneurs with the skills and connections for long-term entry into the capital market. Entrepreneurs will be equipped to enter the capital market and operators will have a technology readiness and stability level equal or more than 8 (Technology Readiness Level: TRL ≥ 8). Entrepreneurs in turn will have a Commercial Readiness Index of at least 2 (CRI ≥ 2), totaling at least 5 businesses.

Activities News



Saraburi Premium Milk launches the Milk and Dairy Market Exhibition

On Wednesday 1 June 2022, the Program Management Unit on Area Based Development (PMU A) and **Chula Unisearch** organized an opening ceremony for the Milk and Dairy Market Exhibition, Saraburi Premium Milk, at Lido Connect. Th event was organized to promote premium milk products from Saraburi Province developed through research and development of dairy product prototypes in the project ***"Developing a model for agribusiness, milk, and premium products in Saraburi Province".*** The project also aimed to open new market channels using information to improve products and to develop a premium milk business model for the next project's dairy farmer group. Visitors could also visit a booth at the event that showcased the project's knowledge transfer activities and prototype premium Saraburi milk products.

Prof. Narin Hiransuthikul, Ph.D., Vice President for Strategic Monitoring and Assessment, Planning, Budgeting, and Well-being at Chulalongkorn University presided over the opening ceremony on this occasion. The event was also attended by Ms. Dararat Phoraksa, Program Management Unit on Area Based Development (PMU A) and a number of Chulalongkorn University representatives, including Prof. Sanipa Suradhat, Ph.D., Dean of the Faculty of Veterinary Science; Prof. Mongkol Techakumphu, DVM., Director of Agritech and Innovation at the Saraburi Campus; Supichai Tangjaitrong, Ph.D., Managing Director of Chula Unisearch; and Assoc. Prof. Kittisak Ajariyakhajorn, DVM., Ph.D., Project Leader and Lecturer at the Department of Veterinary Medicine, Faculty of Veterinary Science. Private sector representatives included NP Dairy from Nutthapron Farm; Petchpana Milk from Prateung Farm; and Be More Milk.

Chulalongkorn University and NSTDA signed a Memorandum of Understanding

On 10 June 2022, Chulalongkorn University (represented by Prof. Chakkaphan Sutthirat, Ph.D., Vice President for Research Affairs) and Ladawan Krasachol, Ph.D., Executive Vice President. acting on behalf of the President of the National Science and Technology Development Agency (NSTDA) signed a Memorandum of Understanding covering academic collaboration on research and development into biological resources and establishment of a national database. The MOU aims to foster collaboration in driving research and development, to generate knowledge, boost research capacity and stimulate and innovation. Moreover, the institutional collaboration will facilitate exchange of information, knowledge, and experience. **Chula Unisearch** was designated to serve as the central coordinating unit. Wonnop Visessanguan, Ph.D., Executive Director of the National Center for Genetic Engineering and Biotechnology; Sissadej Thongsima, Ph.D., Director of the National BioBank of Thailand (NBT), NSTDA; Prof. Polkit Sangvanich, Ph.D., Dean of Faculty of Science; Prof. Pornanong Aramwit, Ph.D., Dean of Faculty of Pharmaceutical Sciences; and Prof. Sanipa Suradhat, Ph.D., Dean of Faculty of Veterinary Science, signed as witnesses at the signing ceremony.

The Thai Red Cross Society discusses whether to accept academic services

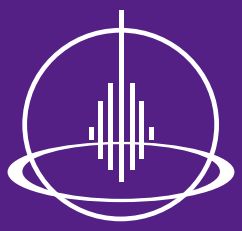
On 15 March 2022, Supichai Tangjaitrong, Ph.D., Managing Director of Chula Unisearch, together with Assist. Prof. Pavinee Inchompoo, Department of Landscape Architecture, Faculty of Architecture; and Assist. Prof. Chatpan Chintanapakdee, Ph.D., Department of Civil Engineering, Faculty of Engineering, welcomed executives from the Thai Red Cross Society to a meeting to discuss academic services and guidelines for implementing design projects under the government's procurement regulations, as well as other projects. The meeting also discussed opportunities to strengthen exchange of academic services, knowledge and experience to foster academic collaboration.

Research and Consultancy Institute, Thammasart University (TU-RAC) discuss academic collaboration

On Tuesday 22 March 2022, Supichai Tangjaitrong, Ph.D., Managing Director of Chula Unisearch welcomed executives and staff from the Research and Consultancy Institute, Thammasat University (TU-RAC), Assoc. Prof. Teera Sindecharak, Ph.D., Director; and Assoc. Prof. Vanapar Tirasangka, Ph.D., Deputy Director of TU-RAC. The two agencies discussed opportunities to collaborate in project consortia for consultancy projects, as well as ideas for study visits and academic exchanges and collaboration between the two organizations.

"Academic Service Guidelines of Chulalongkorn University" Workshop

On 26 April 2022, **Chula Unisearch** hosted a workshop on ***"Academic Service Guidelines of Chulalongkorn University"*** to develop strategies and plans for the university's academic service operations. The workshop aimed to support and be consistent with the university's philosophy and mission to creating people and knowledge for society. The meeting, held at the Sasin Graduate Institute of Business Administration of Chulalongkorn University, was presided over by Prof. Chakkaphan Sutthirat, Ph.D., Vice President for Research Affairs and Executive Chairman of Chula Unisearch. Supichai Tangjaitrong, Ph.D., Managing Director of Chula Unisearch, presented guidelines for academic services offered by **Chula Unisearch** on behalf of the university. Participants including the University's Executive Committee, Executive Directors, Department Managers, and Section Managers, brainstormed and proposed guidelines for providing academic services across a variety of subject areas and drafted recommendations to enhance the University's portfolio and be proactive in offering academic services. These recommendations will contribute to enhancing the efficiency of delivery of academic services to support the university's goals.



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