International Journal of Computing Sciences Research (ISSN print: 2546-0552; ISSN online: 2546-115X)
Vol. 7, pp. 1152-1161
doi: 10.25147/ijcsr.2017.001.1.124
https://stepacademic.net

Short Paper *

A Review of Cryptocurrency in the Digital Economy

Tamonwan Sitthipon
University of Geomatika, Malaysia
tamonwan.f@gmail.com
ORCID ID: orcid.org/0000-0002-2280-7871
(corresponding Author)

Pichart Kaewpuang
Phranakhon Rajabhat University, Thailand
pichart@pnru.ac.th
ORCID ID: orcid.org/0000-0003-3225-5211

Pichakoon Auttawechasakoon
Burapha University, Thailand
65910012@go.buu.ac.th
ORCID ID: orcid.org/0000-0002-2247-6750

Date received: August 21, 2022
Date received in revised form: October 3, 2022; November 3, 2022
Date accepted: November 4, 2022

Recommended citation:

> Sitthipon, T., Kaewpuang, P., & Auttawechasakoon, P. (2023). A Review of Cryptocurrency in the Digital Economy. *International Journal of Computing Sciences Research*, 7, 1152-1161. https://doi.org/10.25147/ijcsr.2017.001.1.124

*****Special Issue on Metaverse and Cybersecurity in the Digital Economy. Guest Editor: Supaprawat Siripipatthanakul, Ph.D. Supervisor & Lecturer at University of Geomatika, Malaysia; DBA Researcher at Manipal GlobalNxt University, Malaysia.*

Abstract

Purpose – Cryptocurrency in the digital economy plays a vital role and is growing exponentially. This article aims to review cryptocurrency in the digital economy.

Method – A narrative synthesis was employed. Moreover, the researchers conducted a systematic documentary review and used content analysis to analyse the data. The literature was reviewed systematically to describe cryptocurrency in the digital economy. The literature and information were obtained from various books and research articles on EBSCO, Google Scholar, Scopus, Web of Science, and ScienceDirect. The inclusion criteria

were studies that clearly defined the cryptocurrency in the digital economy, were published and written in English and were peer-reviewed.

Results – The results reveal that cryptocurrency is a subset of digital currency that has increased. Furthermore, the opportunities and challenges of cryptocurrency are critical to the economic systems of many countries in the digital economy.

Conclusion – Cryptocurrency in the digital economy is essential. Thus, it is crucial to pay close attention to cryptocurrency to improve and grow economic systems.

Recommendations – The recommendation is to consider empirical research. Moreover, it is recommended to consider a quantitative study, such as online surveys. A qualitative approach, such as online interviews, could also give insight results and a clear view.

Research Implications – This review article contributed to the existing literature on cryptocurrency in the digital economy. Hence, it could guide future research on cryptocurrency in the digital economy. Moreover, the implications could be applied to any sector to better understand and implement appropriate strategies regarding cryptocurrency in the digital economy.

Keywords – cryptocurrency, digital economy, technology, digitalisation, review

INTRODUCTION

The advancement of information and communication technologies (ICT), the spread of the Internet, and mobile communications have all contributed to globalisation entering a qualitatively new stage of development. The computer and newly generated ICTs are the main technological attributes of the current settings of globalisation, uniting the world into a single communication system and creating an integrated financial and information space. Moreover, the economy is primed for new and emerging forms of consumption. These are the outcomes of a convergence of technological, economic, and sociocultural phenomena that are currently changing traditional conditions of commercial exchange (Edoho, 2013; Limna et al., 2022). In the digital economy, cryptocurrency is a recent phenomenon that has received much attention. On the one hand, it is based on fundamentally new technology. It is full potential unknown. On the other hand, at least in its current form, it serves similar functions as other, more traditional assets (Liu & Tsyvinski, 2021). In addition, cryptocurrency is a method of creating virtual "coins" and ensuring their secure ownership and transaction through a cryptographic problem. This problem is designed to be simple to verify but computationally difficult to solve. For this purpose, cryptocurrencies use various functions, the most common being a hash target, which calculates hashes to be less than a specific value (Harwick, 2016). Cryptocurrency has emerged as a powerful financial software system. It is built around a secure distributed ledger data structure, and mining is an essential component of such systems. Mining adds records of previous transactions to the Blockchain distributed ledger, allowing users to reach a secure, robust consensus for each transaction. Mining also creates wealth in the form of new currency units

(Mukhopadhyay et al., 2016). Cryptocurrency, like blockchain technologies, is the key to constructing a globally inclusive digital economy that is auditable and secure and transparently accountable to the world's citizens. When governments struggle to re-establish public trust in cross-border economic cooperation, blockchains can be critical in bolstering economic resilience while ensuring the global economy works for everyone (Maupin, 2017). Hence, the future of monetary systems has been extensively discussed by scholars and policymakers around the world in an era of growing interest in digitalisation and cryptocurrencies. There are numerous aspects to the debate. The risks and opportunities presented by the rise of cryptocurrencies must be assessed to determine the need for regulations and specific efforts at innovation. This analysis is also required to determine how potential new designs can be shaped in the financial system (Karahan, 2021). Therefore, cryptocurrency in the digital economy is a critical topic to study.

LITERATURE REVIEW

Digital Economy

The digital economy is growing exponentially, particularly in developing countries (Williams, 2021). The digital economy, based on digital technologies, refers to the digitisation of the economy or the provision of digital technologies to various economic sectors. In addition, the digital economy aims to enhance economic activity by developing digital data and applying information and communication technology (Limna et al., 2022). In the digital economy, efficiency is dynamic rather than static. It is more concerned with new activities and products than with increased productivity. The widespread use of the Internet, a new level and form of connectivity among multiple heterogeneous ideas and actors have given rise to a vast array of novel combinations, which is truly novel about the New Economy. The effects on productivity and efficiency are quantifiable. Still, the long-term effects are incalculable (Siripipatthanakul et al., 2022). Digital computing technology has been developed on various digital platforms via internet-based business development to support the currently developing digital economy (Sarjana et al., 2021). The internet, digital automation, social media, electronic communication such as email, and digital payments such as Apple Pay, bitcoin, bank transfers, as well as cryptocurrency like Libra, are all essential components of the digital economy (Babkin Alexander et al., 2017; Limsakul & Kraiwanit, 2020; Limna et al., 2022). Moreover, the digital segment, the information technology (IT) segment providing critical digital services and goods, real digital economy, which is known as the segment of economic output determined primarily and solely from digital technology with business frameworks based on digital services and goods, is the foundation of the digital economy. The digital economy includes the digital sector, the Internet of Things (IoT), emerging platforms, and digital services. The broader scope provides for applying economic segments known as digitised economies in this case (Williams, 2021).

The modern economy is evolving in a processable format to become a virtual economic system eventually. The digital economy is a new economic development paradigm that restructures business relationships based on the use of information. Further information and network technologies are becoming critical factors in globalising

economy production, contributing to the rapid transition of economic agents from the real sector to the network sector, ensuring the development of the digital economy and the formation of innovative business processes (Vovchenko et al., 2017). Currently, the digital economy, based on information technology and data, is booming and has become a powerful force in promoting the economic growth of various countries. In China, economic development has reached a new normal, and the digital economy has emerged as one of the critical drivers of high-quality economic growth (Zhang et al., 2021). In the Philippines, Filipinos participate in a communicative ecology of practices and relationships that shift from one device and platform to the next. As Filipinos' geographical and social mobility increased, digital communication became critical to meet citizens' increasing informational, economic, social, and political demands. This increased consumption capacity, combined with the availability of low-cost devices and internet promotions by telecommunications and Internet companies catering to a wide range of income groups, fuelled the digital communication boom, with the Philippines now considered one of the largest markets for platforms such as Facebook and YouTube, and consistently topping the world in terms of time spent per day on social media (Lorenzana & Soriano, 2021). In Thailand, the government is working on expanding the digital economy. In conjunction with the Fourth Industrial Revolution, the Thai government announced the Thailand 4.0 policy in 2016 to create an innovation-led economy that produces higher value. Simultaneously, due to innovative developments in information and communication technologies, the rate of change opens new frontiers of public engagement and policymaking in electronic government or e-government (Chiengkul, 2019; Sagarik, 2021). Hence, there is a growing trend in the digital economy. The opportunities and challenges of the digital economy are significant to many countries' economic systems (Limna et al., 2022).

Cryptocurrency

Throughout its brief existence, the cryptocurrency market has evolved erratically and at an unprecedented rate. Since the public release of the first anarchic cryptocurrency, Bitcoin, in January 2009, more than 550 cryptocurrencies have been developed, most of which have had limited success (Farell, 2015). Cryptocurrency is a technology that uses blockchain to create digital money, electronic money, or virtual money that is like real money but has no physical form. By utilising this blockchain technology, all transactions will become very transparent. All existing data will relate to one another, with each current data having one user within the scope of the cryptocurrency system (Amsyar et al., 2020). Cryptocurrency is a subset of the digital currency class, but it has grown significantly. Unlike other digital currencies, which can be issued centrally, circulated within a community or geographical location, or linked to fiat currency or the organisations that give them, cryptocurrency has very distinct characteristics. Cryptocurrency blockchain technology is an open distributed ledger that records transactions. It eliminates the need for a trusted third party and the problem of double spending. Moreover, decentralisation enables blockchain technology to increase capacity, improve security, and settle transactions more quickly. Some of these characteristics rank high on traditional financial systems' flaws. Blockchains and cryptocurrencies have emerged as two of the financial industry's most pressing topics (Chuen et al., 2017; Hayes, 2017).

According to Amsyar et al. (2020), cryptocurrency has seven introductory provisions, as shown in Figure 1, including digital, decentralised, peer-to-peer, username, without trust, encrypted, and global. Cryptocurrency exists only in the computer, not as coins, notes, or other tangible items. Moreover, it lacks a central server or primary computer. Thousands of computers are connected via network media to exchange cryptocurrency. A network without a central server is also known as a decentralised network. Cryptocurrency is linked through one person and is forwarded to other people online. There are no third-party terms in cryptocurrency, so users interact directly without the involvement of third-party entities such as banks, Facebook, and PayPal. In terms of usernames, users no longer need to include their personal information as a condition of cryptocurrency. Thus, anyone can use cryptocurrency without providing personal information. Additionally, cryptocurrency users want control over their data and money, so having a third party can interfere with cryptocurrency. All users will be given a unique code that will protect their data and make it nearly impossible for other users to hack into it, this is also known as cryptography. Furthermore, encryption is the process of hiding all of the user's data using cryptography, as defined by crypto. Every country has its currency, known as fiat, and sending currencies to other countries or the entire world is extremely difficult. This issue can be solved with cryptocurrency. Because cryptocurrency is a digital currency with no limits, it is simple to gain access and send it to any country or worldwide.

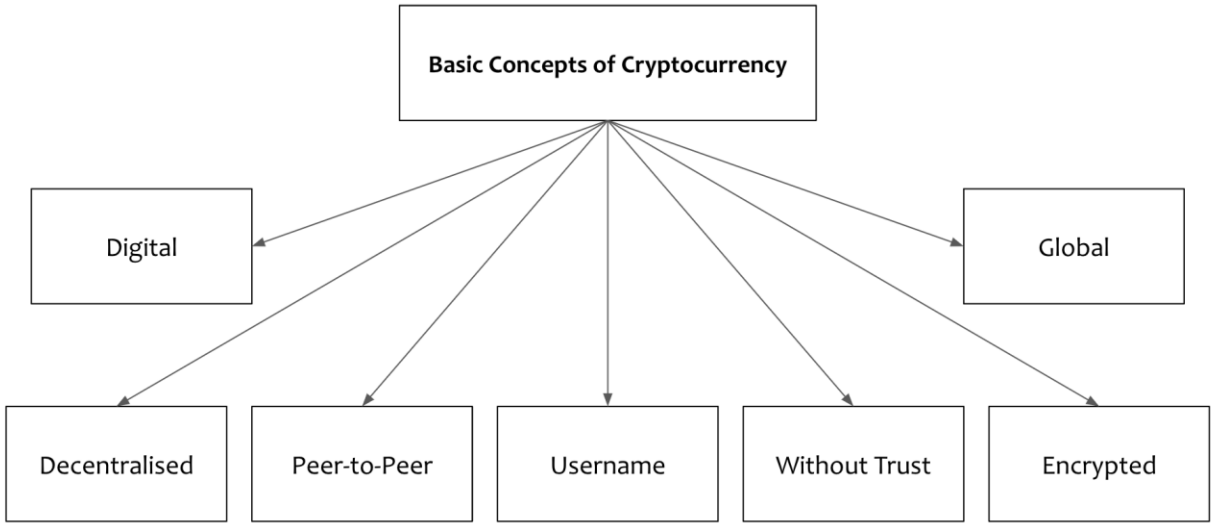

Figure 1. Basic Concepts of Cryptocurrency (Amsyar et al., 2020)

The explosive growth of global cryptocurrency markets presents novel regulatory challenges. Some policymakers and academics are concerned that regulation will drive trading activity to less-regulated jurisdictions or even suffocate a promising new financial asset class. Others believe that regulatory actions will stimulate activity by clarifying market participants. Behind this disagreement is a discussion about the desirability of either outcome. Some believe governments should encourage the development of the cryptocurrency sector within their countries, while others believe that cryptocurrencies should be restricted through strict regulation or even outright bans. However, these debates have been almost entirely conducted without data on the effects of law on market activity (Feinstein & Werbach, 2021; Mikhaylov et al., 2021). Furthermore, the inefficiency of cryptocurrency markets varies over time. Higher liquidity improves, but

higher volatility reduces cryptocurrency efficiency, depending on the quantiles. Therefore, high liquidity combined with low volatility allows active traders to arbitrage opportunities, resulting in market efficiency (Al-Yahyaee et al., 2020). Other advantages of introducing cryptocurrency include irreversible transactions, low transfer fees, complete isolation of the currency from inflation, etc. At the same time, cryptocurrency has negative implications. For example, the inability to track remittances and the system's vulnerability create conditions for illegal operations such as money laundering, capital flight, terrorism, etc. Another disadvantage of cryptocurrency is its reliance on supply and demand. As a result of its ambiguous attitude, the legal status of cryptocurrency in many countries is not fully defined. However, it should be acknowledged that its appearance on the global market is a phenomenon that, in theory, has the potential to fundamentally alter the existing financial system (Bachaev & Abdulazizova, 2020).

RESEARCH METHODOLOGY

The process of conducting a systematic review and synthesis of findings from multiple studies that heavily rely on words and text to summarise and explain the synthesis's findings is referred to as narrative synthesis (Limna, 2022). In purposive sampling, researchers use their knowledge to select the most beneficial sample, commonly used in qualitative research. The goal is to gain in-depth knowledge (Limna et al., 2021; Siripipattanakul et al., 2022). Texts are a common starting point for qualitative content analysis. The aim is to condense a large amount of text into a well-organized and concise summary of key findings (Jaipong et al., 2022). Thus, the researchers conducted a systematic documentary review and used content analysis to analyse the data. In addition, for data collection and data analytics, English-language, peer-reviewed articles from ScienceDirect, PubMed, Google Scholar, Scopus, and Web of Science were included. Data collection and analysis were between June 10 and July 25, 2022.

DISCUSSION

Williams (2021) confirmed that the digital economy is expanding exponentially, especially in developing countries. Furthermore, Limna et al. (2022) concluded that there is a growing trend in the digital economy. The opportunities and challenges of the digital economy are significant to many countries' economic systems. Chuen et al. (2017) and Hayes (2017) indicated that cryptocurrency had grown significantly, and its characteristics are distinct. The blockchain technology behind cryptocurrency is an open distributed ledger that records transactions. It eliminates the need for a responsible third party and the issue of double spending. Furthermore, decentralisation allows blockchain technology to scale, improve security, and settle transactions more quickly. Some of these characteristics rank high on the list of flaws in traditional financial systems. In addition, Amsyar et al. (2020) and Bachaev and Abdulazizova (2020) stated that cryptocurrency has both positive and negative implications. Some advantages of incorporating cryptocurrency include irreversible transactions, low transfer fees, complete isolation from inflation, etc. Examples of negative implications include the inability to track remittances and the system's vulnerability, encouraging illegal operations such as money laundering, capital flight, and terrorism. Another drawback of

cryptocurrency is that it is subject to supply and demand laws. Therefore, cryptocurrency plays a critical role in the digital economy. It is crucial to carefully pay attention to cryptocurrency in the digital economy to enhance and grow the economic systems.

RESULTS AND CONCLUSIONS

The modern economy is eventually transforming into a processable format to become a virtual economic system. The digital economy is a new economic development paradigm that uses information to restructure business relationships. Cryptocurrency is a subset of digital currency, but it has grown significantly in popularity. In contrast to other digital currencies, which can be issued centrally, circulated within a community or geographical location, or linked to fiat currency or the organisations that provide it, cryptocurrency has very distinct characteristics. The blockchain technology behind cryptocurrency is an open distributed ledger that records transactions. It eliminates the need for a responsible third party and the issue of double spending. Furthermore, decentralisation allows blockchain technology to scale, improve security, and settle transactions more quickly. Yet, there are some challenges for cryptocurrency. For example, the inability to track remittances and the system's vulnerability create conditions for illegal operations such as money laundering, capital flight, terrorism, etc.

The digital economy is growing exponentially, particularly in developing nations. The digital economy is experiencing expansion. The opportunities and challenges presented by the digital economy are significant for the economic systems of many nations. The cryptocurrency's growth was substantial, and its characteristics are unique. The blockchain technology underlying cryptocurrencies is a transparent, decentralised ledger that records transactions. It eliminates the requirement for a third party and the issue of double spending. Moreover, decentralisation enables blockchain technology to scale, enhance security, and settle transactions faster. These characteristics are prominent on the list of traditional financial system flaws. Moreover, cryptocurrency has both positive and negative consequences. Incorporating cryptocurrency has numerous benefits, including irreversible transactions, low transfer fees, complete isolation from inflation, etc. Adverse effects include the inability to track remittances and the system’s vulnerability, which encourages illegal activities such as money laundering, capital flight, and terrorism. Another disadvantage of cryptocurrencies is that they are subject to the laws of supply and demand. Consequently, cryptocurrencies play an indispensable role in the digital economy. To strengthen and expand economic systems, it is essential to pay close attention to cryptocurrencies in the digital economy.

RECOMMENDATIONS

The recommendation is to consider empirical research. Moreover, it is recommended to consider a quantitative study, such as online surveys. A qualitative approach, such as online interviews, could also give insight results and a clear view.

RESEARCH IMPLICATIONS

This study contributed to the existing literature on cryptocurrency in the digital

economy. Thus, it could guide future research on cryptocurrency in the digital economy. Furthermore, the implications could be applied to any sector to better understand and implement appropriate strategies regarding cryptocurrency in the digital economy.

DECLARATIONS

Conflict of Interest

All authors declared that there is no conflict of interest.

Inform Consent

It may not be applicable because this paper is a review article, and no respondents are involved.

Ethics Approval

It may not be applicable because this paper is a review article, and no respondents are involved.

REFERENCES

Al-Yahyaee, K. H., Mensi, W., Ko, H. U., Yoon, S. M., & Kang, S. H. (2020). Why Cryptocurrency Markets are Inefficient: The Impact of Liquidity and Volatility. *The North American Journal of Economics and Finance*, *52*, 101168.

Amsyar, I., Christopher, E., Dithi, A., Khan, A. N., & Maulana, S. (2020). The Challenge of Cryptocurrency in the Era of the Digital Revolution: A Review of Systematic Literature. *Aptisi Transactions on Technopreneurship (ATT)*, *2*(2), 153-159.

Babkin Alexander, V., Burkaltseva Diana, D., Pshenichnikov Wladislav, W., & Tyulin Andrei, S. (2017). Cryptocurrency and Blockchain-Technology in Digital Economy: Development Genesis. *π-Economy*, *67*(5), 9-22.

Bachaev, U. A., & Abdulazizova, E. A. (2020). Cryptocurrency As a Component Of The Digital Economy. In *European Proceedings of Social and Behavioural Sciences (EpSBS)*, 1393-1398. https://doi.org/10.15405/epsbs.2020.10.05.183.

Chiengkul, P. (2019). Uneven Development, Inequality and Concentration of Power: A Critique of Thailand 4.0. *Third World Quarterly*, *40*(9), 1689-1707.

Chuen, D. L. K., Guo, L., & Wang, Y. (2017). Cryptocurrency: A New Investment Opportunity?. *The Journal of Alternative Investments*, *20*(3), 16-40.

Edoho, F.M. (2013). Information and Communications Technologies in the Age of Globalization: Challenges and Opportunities for Africa. *African Journal of Economic and Management Studies, 4 (*1), 9-33.

Farell, R. (2015). *An Analysis of the Cryptocurrency Industry. Wharton Research Scholars.* Retrieved from https://repository.upenn.edu/wharton_research_scholars/130.

Feinstein, B. D., & Werbach, K. (2021). The Impact of Cryptocurrency Regulation on

Trading Markets. *Journal of Financial Regulation*, *7*(1), 48-99.
Harwick, C. (2016). Cryptocurrency and the Problem of Intermediation. *The Independent Review*, *20*(4), 569-588.
Hayes, A. S. (2017). Cryptocurrency Value Formation: An Empirical Study Leading to a Cost of Production Model for Valuing Bitcoin. *Telematics and Informatics*, *34*(7), 1308-1321. https://doi.org/10.1016/j.tele.2016.05.005.
Jaipong, P., Sriboonruang, P., Siripipattanakul, S., Sitthipon, T., Kaewpuang, P. & Auttawechasakoon, P. (2022). A Review of Intentions to Use Artificial Intelligence in Big Data Analytics for Thailand Agriculture. *Review of Advanced Multidisciplinary Sciences, Engineering & Innovation, 1*(2), 1-8.
Karahan, H. (2021). Assessing the Future Prospects for Cryptocurrencies. *International Journal of Business Ecosystem & Strategy (2687-2293)*, *3*(1), 32-37.
Limna, P. (2022). Artificial Intelligence (AI) in the Hospitality Industry: A Review Article. *International Journal of Computing Sciences Research, 6*, 1-12.
Limna, P., Kraiwanit, T., Siripipatthanakul, S. (2022). The Growing Trend of Digital Economy: A Review Article. *International Journal of Computing Sciences Research*, *6, 1-11*. https://doi.org/10.25147/ijcsr.2017.001.1.106.
Limna, P., Siripipatthanakul, S., & Phayaphrom, B. (2021). The Role of Big Data Analytics in Influencing Artificial Intelligence (AI) Adoption for Coffee Shops in Krabi, Thailand. *International Journal of Behavioral Analytics*, *1*(2), 1-17.
Limsakul, A., & Kraiwanit, T. (2020). Libra as a Digital Currency and its Impacts on the Thai Economy. *AU eJournal of Interdisciplinary Research*, *5*(2), 110-118.
Liu, Y., & Tsyvinski, A. (2021). Risks and Returns of Cryptocurrency. *The Review of Financial Studies*, *34*(6), 2689-2727.
Lorenzana, J. A., & Soriano, C. R. R. (2021). Introduction: The Dynamics of Digital Communication in the Philippines: Legacies and Potentials. *Media International Australia*, *179*(1), 3-8. https://doi.org/10.1177/1329878X211010868.
Maupin, J. (2017). *The G20 Countries should Engage with Blockchain Technologies to Build an Inclusive, Transparent, and Accountable Digital Economy for All*, No. 2017-48. Economics Discussion Papers.
Mikhaylov, A., Danish, M. S. S., & Senjyu, T. (2021). A New Stage in the Evolution of Cryptocurrency Markets: Analysis by Hurst Method. In *Strategic Outlook in Business and Finance Innovation: Multidimensional Policies for Emerging Economies*. Emerald Publishing Limited, Bingley, pp. 35-45.
Mukhopadhyay, U., Skjellum, A., Hambolu, O., Oakley, J., Yu, L., & Brooks, R. (2016). A Brief Survey of Cryptocurrency Systems. In *2016 14th annual conference on privacy, security and trust (PST)*, pp. 745-752. IEEE.
Sagarik, D. (2021). Rethinking And Reshaping Thailand's National E-Payment in The Post-Covid Era. *International Journal of eBusiness and eGovernment Studies*, *13*(1), 240-262. https://doi.org/10.34109/ijebeg.202113112.
Sarjana, S., Najib, M. A. A., & Khayati, N. (2021). Bibliometric Analysis to Encourage the Development of Digital Economy Scientific Studies. In *Conference Towards ASEAN Chairmanship 2023 (TAC 23 2021)*, pp. 14-21. Atlantis Press.
Siripipattanakul, S., Siripipatthanakul, S., Limna, P., & Auttawechasakoon, P. (2022). Marketing Mix (4Cs) Affecting Decision to be an Online Degree Student: A Qualitative Case Study of an Online Master's Degree in Thailand. *International Journal on Integrated Education*, *5*(4), 31-41.

Siripipatthanakul, S., Jaipong, P., Limna, P., Sitthipon, T., Kaewpuang, P., & Sriboonruang, P. (2022). The Impact of Talent Management on Employee Satisfaction and Business Performance in the Digital Economy: A Qualitative Study in Bangkok, Thailand. *Advance Knowledge for Executives*, *1*(1), 1-17.

Sitthipon, T., Kaewpuang, P., Jaipong, P., Sriboonruang, P., Siripipattanakul, S. & Auttawechasakoon, P. (2022). Artificial Intelligence (AI) Adoption in the Medical Education during the Digital Era: A Review Article. *Review of Advanced Multidisciplinary Sciences, Engineering & Innovation, 1*(2), 1-7.

Vovchenko, N. G., Andreeva, A. V., Orobinskiy, A. S., & Filippov, Y. M. (2017). Competitive Advantages of Financial Transactions on the Basis of the Blockchain Technology in Digital Economy. *European Research Studies*, *20*(3B), 193-212.

Williams, L. D. (2021). Concepts of Digital Economy and Industry 4.0 in Intelligent and Information Systems. *International Journal of Intelligent Networks*, *2*, 122-129.

Zhang, W., Zhao, S., Wan, X., & Yao, Y. (2021). Study on the Effect of Digital Economy on High-Quality Economic Development in China. *PloS one*, *16*(9), e0257365.