Copyright Law Guidelines to Promote a Digital Economy: A Case Study of Big Data

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The advancement of technological innovation has begun to play a role in the development of competitiveness in the industrial sector of Thailand. The government sector has determined its inability to establish a regulatory framework by introducing a copyright legislation, which is considered as a practical solution for both government and the private sector. This research has three objectives: 1) studying the situation of big data management in organizations under the digital economy; 2) studying the problem of copyright law with regards to big data in Thailand; and 3) proposing guidelines for promoting the success of copyright law with regards to big data in Thailand. The researcher used qualitative methods to conduct in-depth interviews with 60 key informants from three target groups of business; including 20 persons from banking businesses, 20 persons from real estate businesses, and 20 persons from retailer businesses, which are involved with copyright law in the context of big data in Thailand. The study found that Thailand's leading companies demonstrate their relationship with big data management scenarios. That is, when the data becomes more diverse and continually increases, consumer behaviours change according to current value. The big data analytics also show that the banking group focuses on big data more than other business segments. Big data copyright law problems in the digital economy include security issues and access to personal information. Promoting the success of big data copyright law contains 3 guidelines: 1) enforce on personal data by legislation encompassing the exchange of big data through the consent of the data owner; 2) copyright law requires flexibility and must not hinder the development of technology in line with the digital world, and 3) develop qualified personnel in big data and artificial intelligence (AI), to promote and support professional data engineers, data scientists, and data analysts.

Key words: *Big data / copyright law / digital economy.*

Background and Significant of the Problems

Under the flow of change, the economic model of the country reflects the context of driving the database-monitoring mechanism linked by the modern world's civilization, the digital world. Technological advances are underlined to emphasize the importance of global change when the world is not the same[1], but dynamic all the time (Division of Research Administration and Educational Quality Assurance, 2016). Based on the analysis of Thailand's economic growth over the past five years, the average rate has increased by only 3.5 percent. If this continues, Thailand will continue to be trapped in Middle Income Trap for another 30 years (Wongsinthuwiset and Jarunpipatkul, 2017). With the advent of 5G technology in Thailand[2], it reflects the increasing demand of technology users. However, although technological development from all over the world will result in the growth of the industry, Thailand has no sufficient measures to plan aggressive targets that link technology to industrial development. (Chareonporn, 2010; Mbella & Fonjong, 2018). These transformations of dynamism lead to a new model of Thailand or "Thailand 4.0"[3] to adjust the economic development model in line with current technological advances (Haseeb, Hussain, Slusarczyk, & Jermsittiparsert, 2019; Syazali, Putra, Rinaldi, Utami, Widayanti, Umam, & Jermsittiparsert, 2019). It has transformed the economy into a "value-based economy" or an innovation-driven economy (Office of the Secretary of the House of Representatives, 2015). For this reason, Thailand has adopted digital technology to restructure its economy to enhance its administrative efficiency and reflect its gross domestic product (GDP). In the second quarter of 2018, the GDP expanded by 4.6 percent, from 4.9 percent in the first quarter of 2018. The main contributor to this growth was the increase in agricultural output, while the industrial and service sectors slowed down (Office of the National Economic and Social Development, 2018). Today, the digital industry has played a very important role in the country's economy, as the context of the global society has changed

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[1] This is a significant word and is written in the blueprint of Thailand 4.0 explaining that the world is dynamic all the time. It was classified into 4 Ages: Age 1 Agricultural Revolution or green evolutions; Age 2 Industrial Revolution 1 and 2; Age 3 Digital Revolution, and Age 4 The Fourth Industrial Revolution or the present. Incorporation and dissolution of technology and innovation in 3 Domains, including 1) Bio Domain such as Bioprint, Genetic Transformation 2) Physical Domain such as Autonomous Vehicle, 3D / 4D Printing and 3) Digital Domain such as Internet of Thing (IoT), Digital Manufacturing. It is seen that Artificial Intelligence (AI) would replace Knowledge Emerge as today.

[2] The NBTC has set up a working group to prepare for the 5G technology, consisting of: 1) Frequency Bands and Telecommunication standards Working Group, and the Telecommunications Licensing Working Group. (The National Broadcasting and Telecommunications Commission (NBTC), 2018)

[3] It is the policy of the government of General Prayut Chan-Ocha used in the economic development of Thailand by changing the economic structure of Thailand to "Innovation-driven Economy", to strengthen the Thai economy steadily, prosperously, and sustainably with 3 new growth engines, including Productive Growth engine, Inclusive Growth Engine, and Green Growth Engine. (Khongsanor, 2017)

dramatically. One of the key technologies is big data analytics (Ministry of Information and Communication Technology, 2016). Nowadays, technology and information are increasingly used to access Social Media[4]. In 2018, there are 2.55 billion social media users (Williamson, 2018). This is due to the advancement of technology and information, the cost of accessing information, and the interest in accessing information through social networks.

When it comes to big data[5] adoption in the big data business sector, it is Mega Trends[6] that play an important role in discovering new opportunities for information to create change and competitive advantage in the organization. The goal of big data analytics is to find patterns of relationship of data that are linked together. The analysis will help to determine the direction of the market, the needs of the customer, and improve the way they work in a consistent and current context. When business opportunities come from complex databases, big data is a major source of information. From data collected from past to present, as well as current social demographic, the Gen Y population is abundant in the labor force and is a major force in the economy, so it is necessary to understand the context of technological innovation (Panichpattanakit, 2017). Understanding big data will enable organizations to discover business key success factor, as data analysis and synthesis will create new knowledge and enable organizations to discover the business limitations and opportunities leading the future direction of the organization.

As a result of the above changes, the researcher is interested in studying the overview of big data management in Thailand. The researcher collected data to synthesize and extract the issues, focusing on the characteristics of social media users[7] which are likely to change in Thai society. The researcher is also interested in studying the problem of copyright law[8] with

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[4] Holloman (2013) mentioned that social media is everything that humans use to build relationships with technology, from software, tools, and communication channels. This corresponds to White (2012), who described social media as a form of electronic communication through online communication to share information, ideas, personal information. And social media is also the interaction to create networks. (Jones, 2013)

[5] Nation Taiwan Normal University (2018) explained that big data is a large amount of data that is processed, analyzed, and displayed in an appropriate way. It is often used with the Business Intelligence (BI) concept, which has three key features: 1) Volume – a large or enormous amount of data; 2) Velocity – with changes all the time and fast; and 3) Variety – structured data (stored in the database), unstructured data (i.e. picture files, video files, etc.) or semi-structured. The benefit of big data processing analysis is to make the hidden knowledge visible. This may cause new products or services that are suitable for the consumers. (Department of Local Administration, 2015)

[6] Mega Trends refers to the rapidly changing world of today and affects people both nationally and globally.

[7] Office of Electronic Transactions Development Agency (Public Organization) or ETDA pointed out that the behavior of internet users in Thailand in 2018 continued to increase steadily and has grown over the past year to 3 times, and no matter the age or generation, they all have internet usage hours per day no less than 8 hours. This reflects the fact that Thais are in the transition to a fully digital lifestyle.

[8] Copyright law is intended to protect the work created by the individual, not to allow others to copy or imitate it. It is intended that the creator, who makes or creates the work, by his or her own initiative, bears full advantage in his or her creative work, and for others to respect the rights of creators (Meenakanit, 2018).

big data in Thailand, in order to understand the problems of copyright law in protecting the rights of data owners, specifically, the behavioral data of social media users considered as a measure of organizational success. In addition, the researcher analyzed the results of the study to determine the success of the copyright law with the big data to create confidence in the domestic business sector. In this regard, the researcher strongly hopes that the information obtained from this research will be beneficial to the business and will be promoted to provide current legal protection.

Hypothesis

What are the situations of big data management in organizations under the digital economy?

What is the state of problems in the success of copyright law with the big data in Thailand?

What are the guidelines for the success of copyright law with regards to big data in Thailand?

Objectives of the Research

To study the big data management in organization under the digital economy
To study the problems and to propose guidelines for the success of copyright law with big data in Thailand

Scopes of the Research
Scope of Content

In this study, the researcher studied the concept of big data under the digital economy with the advancement of technology, and studied the concept of copyright law: intellectual property from the data collection. The researcher also synthesized the form of technology, studied literature related to the success of copyright law and big data in Thailand.

Scope of Area

The researcher used a specific area's selection method. Businesses trending with increased big data use were selected, which included banking business, real estate business, and retail business.

By virtue of Section 4 of the New Copyright Act 1994, copyright means the sole right to do anything about the work that the creator has made. There are 7 categories: 1) Literature 2) Drama 3) Art 4) Music 5) Audiovisual, Film, Voice Broadcasting 6) Voice Recording and 7) Acting, which may include all assets. According to the Civil and Commercial Code, Section 138 states that in addition to the form of property, which a person owns, the person also has the right to a formless object that is legally accepted and protected as well.

Scope of Populations and Key Informants

The researcher interviewed key informants from all 3 businesses trending with increased big data use, 20 persons from each business, for a total of 60 persons.

Scope of Period

The study of guidelines for the success of copyright law with the big data in Thailand was from January 2017 to October 2017, for a total of 10 months.

Research Methodology

In this study, the researcher used qualitative research, collecting data by documentary research, both theories and researches related to big data and copyright law in Thailand. The researcher also used in-depth interview with key informants representing banking business, real estate business, and retail business with regards to copyright law and big data in Thailand. The researcher used content analysis method based on the research objectives to analyze and summarize the nature of copyright laws with the big data in Thailand, and used typology and taxonomy analysis, as well as induction method to analyze the situation of big data management in the organization, the nature of the problem, and the copyright law with regards to big data in Thailand, in order to propose guidelines to promote the success of the copyright laws with big data in Thailand.

Study Results
Big Data Management in Organizations
Characteristics of Big Data

The results show that Thailand's leading companies in the banking, real estate, and retail businesses have the same definition of big data[9] as new trend of the digital world. There are 3 main characteristics are as follows.

Data Diversity

Diversity in data is one of the findings related to the form of the relationship between organizations and their customers. To response the demand, the potential benefits of social

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[9] Bernard, M. B 2015 said that the important beginning of the big data dated back to the Roman War. The data was used to analyze the military approach and to develop the city since the BC. Later in 1663, the British statistician John Graunt presented the first military statistical analysis with a clear record of how big data in the past used statistical principles as a military and politics strategy.

values are always considered. The study found that having a large number of customers and variety of customers created a challenge for the organization. Due to the social context being shaped by corporate culture, big data has been adopted, reflecting the advancement of technological innovation in a variety of forms such as VDO conference, historical data analysis to forecast the future of the organization, and more. As a result of data diversity, the company needs to manage customer data in a systematic way. For example, Central Retail Corporation[10] classifies its management into 3 department stores, 1 supermarket and 5 specialty stores, which offer a variety of services and meet the needs of different customers. Although it is the same set of data, because of different systems, it can be regarded as diversity in data. Therefore, the use of data requires analysis and correlation of variables and sources of data to be processed accurately and quickly (Kulwanitchaianan, 2018).

It can be said that Data Diversity is the beginning of big data, which reflects the context of enhancing data quality standards and it is a significant factor in making the industry more reliable. In the current situation, the European Union (EU) has defined a pan-European[11] approach specifying the right and consent attached to various types of data. This will increase the capacity of the organization to manage data from different sources appropriately (European Commission, 2017).

Real-time Data Change

Under the context of globalization, we can see the link between global economic and technological advances, resulting in changes in consumer behavior. The study found that leading Thai companies need to understand the dynamics of change based on uncertainty over both in technology and customer demands in real time. In addition, customers have access to information on their own, so the company must adapt to changing needs, taking into account customer expectations. This is one of the company's challenges to provide customized solutions. For example, Siam Commercial Bank has found that customers need secure information and fast and convenient financial services. As a result, the bank has implemented Fault Detection (Kulwanitchaianan, 2018) and designed service strategies tailored to diverse and fast changing customer behaviors. When all banks understand the problem, competition[12] in the banking business will occur to draw the customer base.

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[10] The company has been awarded the Number 1 Best-Selling Retailer in Thailand and the Number 1 Best Retailer Award in Asia Pacific in 2005, based on Retail Asia magazine's ranking with Euromonitor International and KPMG.

[11] It promotes the data quality that supports digital marketing by creating a harmonious European framework, where data access is critical for data gathering so that organizations can define operational guidelines consistent with current problems.

[12] On March 26, 2018, Siam Commercial Bank announced the cancellation of transaction fee through the SCB EASY every application, including interbank funds transfer, cross-border transfer, pay bills, prepaid, and cardless ATM around Thailand. On March 28, 2018, Kasikorn Bank also announced the fee cancellation.
This demonstrates the adaptability of the banking business to changing information and customer needs.

Real-time data change is a problem and obstacle causing data redundancy and incorrect processing, and this may lead to data corruption (Schonberger and Cukier, 2013). When the company has a strong big data, it creates protection and warns[13] of unexpected events so that the company can adapt to the change in a timely manner. However, the dynamics of data is inevitable. In the current circumstances, the emergence of new technologies is viewed as normal. Considering the change with the evolution of current and future technology, Artificial Intelligence (AI) will be related as it refers to the intelligent act of machinery that can mimic human behavior. It is an action and there is Machine Learning or Data Science as the brain (Russell and Norvig, 2010). In view of the banking business, it can be said that AI had an important role to recheck transactions such as electronic fraud alert on your credit card; with Fault Detection Model, it is an early warning system to the owner of the credit card immediately. As a result, the company needs to continually review big data and its business environment so that it can tailor its development strategies to fit the needs of its customers.

Massive Data Volume

Digital world has been risen by the combination of very large amount of data through electronic that is unable to clearly identify the extent of the storage space. Big Data can be measured using a comparatively large program like Excel[14] which shows that big data is too large for Excel to support, and it can continue to grow without limit. According to the study, it has been found that big data is characterized by massive volume of data. The leading companies in Thailand have large amounts of data according to the size of the organization, operational data and customer data so they need to manage their data for maximum benefits[15]. Banking business has more than 10 million customers and each group need different financial services. The bank's data volume is increasing and changing day by day, just like retailers need to focus on consumer behavior.

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[13] Pagallo, U (2017) said that company warns can be divided into 3 areas: 1) Technical issue – during these data are being generated; 2) Ethical issue - obtaining consent and data disclosure; and 3) Complexity of big data and Algorithm used in the analysis will provide suggestions that are consistent with the reality and context of current problems.

[14] Typically, Excel can store data up to 1,048,576 rows and 16,384 columns. If the data is larger than this, the other program will be required. (Microsoft, 2018)

[15] Benefits of big data to the business sector or organizations include 1) Make decisions faster and more accurately, such as Adidas, using the appropriate New Arrivals information analysis for each branch (Jen Underwood, 2017); 2) Reduce operating costs such as UPS (the world's largest shipping company) (Foxman, 2012) used big data in computerized routing simulation; and in 2004 UPS announced the not-turn-left routing which reduced fuel consumption by up to 38 million liters per year (Prisco, 2017); 3) Create new products and services, such as Capital One Bank (the 8th largest US bank) conducted 45,000 big data experiments and made difference credit cards that best fit the needs of customers (Clemons and Thatcher, 2002); 4) Understand the market even more, such as Sephora used the point accumulation as a way to collect customer order information and applied it for Cross-Sell and Promotion to suit customers. (Sephora, 2018); and 5) As evidence in work, such as in China, Social Credit or behavior rating is used as proof of citizens' rights. (Botsman, 2017).

This constant increase in data is a testament to the fact that human society is entering the digital age completely and has a leapfrog growth path. In the future, there may be no trace of growth paths for other businesses to follow. But nowadays, all the information that comes out of it is only a small part that can actually be used. Since most storage technologies has just occurred in recent years and data processing also has just been clear, organizations are still unable to adapt to change. Therefore, all organizations or sectors need to understand the context of this dynamic data to build a data-centric network that will benefit business in the digital age.

Big Data Analytics

Big Data is like an iceberg[16] under its surface waiting to be discovered or analyzed. Big Data Analytics[17] is a system where big data databases are analyzed in depth to find patterns of correlated data. Analysis results can lead to effective management of marketing strategy. It is clear that prioritizing big data alone without analyzing data will not benefit the organization. It can be said that the big data that the organization has is a data warehouse from the past to present, thus analysis of data for classification is a key condition for successful business. High potential organizations clearly share the responsibility of data management[18]. Detailed data analysis can predict business trends and predict potential future events, enabling organizations to be prepared for change appropriately. This research analyzes data by classifying businesses into 3 categories: banking, real estate, and retail. Details are explained as follows.

Analysis of Banking Business

Banking business is one of the major cogs driving the country's economy. In particular, the central bank or the Bank of Thailand (BOT), under the supervision of the Ministry of Finance, has a major role in stabilizing the country's financial and economic stability (Bank of Thailand, 2017) and forecasting the financial crisis affecting the quality of people's life as a whole. Banking business needs to focus on in-depth analysis of big data, as customer needs change in the context of technological advances, the improvement of service quality, product

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[16] The surface area is structured data, which accounts for about 20% of all information on the planet. This is a data format that can be easily manipulated. Underneath surface area is unstructured data, which accounts for about 80% of all information (Taylor, 2018). This type of data cannot be stored in Relational Database, so it must be in the form of a non-relational database, and a tool called NoSQL or Not only SQL is used. (Brasetvik, 2013)

[17] Examples of Business Data Analytics use, such as Uber Data Analytics, help automate decision-making to adjust fares when demand is high. Event hostage in central Sydney in Australia, the Uber fares in that area rose fourfold in 2014. (Chadbunchachai and Permsirivallop, 2016)

[18] Various roles in managing big data include: 1) Data Engineer is responsible for reviewing all data structures; 2) Data Scientist is responsible for modeling to produce new results; and 3) Data Analyst is constantly analyzing data as long as the business is still in place and watching for changes or business trends. (Kulwanitchaianan, 2018).

design or financial technology development or FinTech[19]. In Thailand, the banking business has developed and prioritized the analysis of big data to match the financial services model applying FinTech. This research studied 2 banks. Details are as follows.

Kasikorn Bank Public Company Limited or KBank has been aggressive in investing in big data, resulting in KBank becoming the leader in Digital Banking. The bank sees that big data will help drive the company's growth rapidly, so it uses technology such as Cloud Computing to store and analyze data for systematic analysis. Due to the increasing demand of mobile customers or the KPLUS program, the bank is aware of the importance of in-depth analysis. Especially to provide services to new customers smoothly and quickly, Thai Text Analytics program is used as a tool to convert the tone into a language that can capture the feeling (Sentiment). The Bank has applied this program to Call Center to analyze customer's perception of service. If a customer contacts in a day, the system will help them to determine the cause of the customer's inclination and suggest how to improve the service. KBank also has made Social Sensing to retrieve information from social media available on general web browsers, such as posting messages or commenting on the bank in the media or other channels that can be seen by tracking the bank's website. The bank will collect these data to analyze the cause of the problem and design an appropriate customer service approach. At present, K Bank recognizes the importance of technology and customer behavior, and thorough analysis of the data will enable the bank to respond to the changing needs of our customers. K Bank is therefore committed to driving its online financial strategy under the mission "Tomorrow Comes Today" to maintain its customer base and maintain its leadership in Internet Banking.

Siam Commercial Bank Public Company Limited (SCB) is the bank with the most transactions in 3 years from 2016-2019. Aiming to be the number one leader in Internet Banking, the Bank has greatly revolutionized the organization and invested more than 30,000-40,000 million baht to change the technology system in the organization. In addition, the bank has invested in various systems using big data of the bank and analyzed key variables for changing operational direction to meet the changing social context. As a result, the bank has changed the architecture or structure of big data to suit the bank's operational direction. The Bank intends to use technology, instead of human resources, to provide all financial transactions, along with developing relationships and building trust with its customers. At present, the bank continuously analyzes data to find out the behavior and needs of customers and has set up a new subsidiary, SCB ABACUS, which conducts financial business and data analysis, focusing on big data analysis. The driving force of the bank is to

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[19] Wharton School of Business explains that the combination of words between Finance and Technology means innovations brought about by technology that make financial operations more user-friendly and more efficient, in line with consumer lifestyles. (Santiprapop, 2016)

focus on the study of customer behavior and needs to provide the most customer-centric services.

Analysis of Real Estate Business

In the midst of competition in the real estate business for the area and the trust of the customers, customers have changed the behavior of buying real estate by paying attention to the value before deciding. Big Data is used in the real estate business to analyze data and find success factors for big data technology investments[20]. This research studied 2 companies. Details are as follows.

Sansiri Public Company Limited or Sansiri is a leading real estate business in Thailand, focusing on the principles of corporate governance. It also promotes responsibility, duty, transparency and fairness to stakeholders. It also creates competitive ability to maintain capital and add value to shareholders in the long run in the framework of good ethics (Sansiri, 2017). In addition, as recognizing the importance of sales development with the trend of Property Technology (PROP TECH), the company has cooperated with SCB to develop "SIRI VENTURE", a corporate venture capital, which is the Thailand's first full-scale company for research and investment development (R&D) in PROP TECH innovation. Sansiri also believes that "SIRI VENTURE" will help the development of housing related innovations grow faster and stronger.

Land and Houses Public Company Limited is a major real estate trading company in Thailand, with its core policy focusing on its strategy of product and service quality and staff quality to strengthen the product and image of the company. The company has also developed and innovated innovations such as breathing house under the campaign Air Plus, which is the company's copyright; a brand-new condominium EASE focusing on broader consumer than The Key, etc. At present, the company has analyzed the big data to find business risks, production risk, and financial risk (Land and Houses Public Company Limited, 2017). In addition, there is an innovation product contest or LH Product Innovation[21] that demonstrates its commitment to product development and workflows that are consistent with technological change, evolution of materials and design that change over time. Consumer behavior has been analyzed to develop collaborative innovation among employees. As a result, the organization can be driven in the same direction and truly respond to the needs of the consumer.

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[20] The investment in big data consists of: 1) Data - design of the data collection approach, such as Design Thinking principle by Singapore government using to store the number of passengers in each bus while the passengers are unaware that they are providing information; 2) System - data linking using evaluation program; and 3) Personnel – simultaneous development of Data Scientist, Data Engineer and Data Analyst

[21] It was first held in 2009, with all employees involved in creating innovations used to produce products or deliver the product to the customer. (Thairath, 2009)

Based on the analysis of real estate data, the company has focused on researching and producing new innovations to keep pace with the changing consumer demand along with technological change. The company uses a database of consumer behavior studies to determine the properties of innovation. For example, Developing Home Service through Sansiri Mobile Application to reach consumers and encompass all dimensions of living in the long run. Real estate businesses classify the structure of an individual's living style to determine what type of house the customer wants. So, today, big data technology is being developed along with the innovation of Property Technology to create the house according to the needs of each consumer group. Environmental innovation is also being innovated to create a model that is consistent with the changing context of the global society.

Analysis of Retail Business

The advancement of technological innovation is a clear reflection of behavioral change. Traditionally, access to goods and services has been sought through the marketing channels of the community or nearby department stores, but nowadays, customers have more channels to shop, especially open online channels that reach all areas. As a result, retailers are more likely to adapt to the marketing channels and consumer behaviors. Data from various channels (Omni-Channel) must be collected for analysis and use in order to maximize the benefits of management and customer satisfaction. This includes predicting the direction of change in shopping preferences so that organizations can better prepare themselves and look for opportunities in the future. Therefore, big data analysis is a way of adjusting to the survival of the retail business in a changing dynamics. The researcher provided examples of leading retailers in Thailand as follows.

Central Retail Corporation Co., Ltd. is a growing company in Thai society and contributes to the prosperity of the country's economy. The company has a management approach under its vision "To be number one retail store for customer". The company's Core Values[22] reflect on being a non-stop organization and focusing on data collection for big data analysis. For example, the Company studies the behavior of the purchase through The 1 Card, its purpose is not only for customers accumulate points, but also a strategy to create Loyalty Program or the trust to customers. Lifecycle Management also has been developed to collect and store customer information. It will be the data warehouse of shopping behavior of all customers, including sex, age, education level and income, to analyze the benefits of specific groups (Segmentation Schemes), such as discount by personal shopping list, privileges to attend events and receive exclusive offers from clubs. This is to meet the needs of each customer to

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[22] A guideline that the staff take and practice, including 1) Aim means to always develop; 2) Bring means to offer the best to the customer; 3) Do means do it with honesty and ethics; and 4) Give means to respect the value of human (The decryption project of 100 happy organizations, Mor.Por.Por.)

achieve Store Loyalty and create a positive experience for customers. The 1 Card has evolved into a data center and is an important tool to help the organization better understands the needs of its customers. These data are analyzed to determine marketing strategies and business practices in line with changing contexts of consumer behavior and technological innovation in the digital world.

The Mall Group Co., Ltd. is a retail group in Thailand that is aware of changes in consumer behavior. It has applied various technologies to study shopping behavior. At present, the membership database has become more sophisticated and the competition trend has increased, allowing the company to develop software and to conduct in-depth analysis of big data by collecting data from the M Card. Knowing the needs of current and future customers, marketing strategies that focus on customer behavior are defined. Information in M Card makes it possible to know purchase requirements of different ages. The results show that the Gen Z group is the most likely buyer to re-purchase a product. So, the company needs to encourage the Gen Z Group to have M Card to create a cohesive purchasing relationship. For the Gen X and Gen Y groups, most often choose to shop online. These phenomena indicate that the environment or growth period does not determine the purchase path. Gen Z grows with technology, but choose to shop at department stores by themselves. Therefore, the analysis of big data is important to bring benefits to the business. In-depth analysis of M Card enables the company to plan marketing strategies appropriately and in line with the needs of each generation.

Copyright Law Issues - Big Data in the Digital Economy

The digital age is a great transformation of the global community that encompasses all forms of culture, human life, and the use of technology, the dissemination of information, the collection and analysis of information for business application. According to this study, the framework of the GDPR[23] (General Data Protection Regulation) of the European Union (EU) has been classified into two key areas as follows.

Data Privacy

Big Data analysis is related to the customer's personal information, which is the key context for the organization to drive the organization's strategy or direction to the development of big

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[23] General Data Protection Regulation (GDPR) is a European Union law that deals with the protection of personal data privacy. This is effective on May 25, 2018. It provides a way to promote the protection of data privacy of the business sector at a level comparable to international standards and to prevent legal consequences. (Office of Electronic Transaction Development (Public Organization), 2018) In addition, The GDPR also has an important goal: to protect all EU citizens from data privacy and data breaches in today's information-driven world. Business impact includes extraterritorial enforcement, penalties when the organization violates the GDPR, mutual consent conditions, data rights, forgotten data access rights, data portability, and data design privacy. (EU GDPR, 2018)

data technology in the long run. Personal information is part of the Data Flow Diagram (DFD) (Bruza and Weide, 1993) through systematic data validation mechanisms. However, personal information of customers is diverse and dynamic, while copyright laws or other laws in Thailand do not clearly protect data privacy. So, gap of laws may pose a risk of identity theft. Technological innovations are also seen as new and many people think it is unlikely to affect the wider society. For judicial review of Thai lawyers in respect of privacy violations, in case of technological disputes, it is necessary to understand the basic context of technology in order to make the case accurate and fair. In the context of the foreign or European Union (EU) Regulation (EU) 2016/679 concerning the General Data Protection Regulation: GDPR), which aims to control the information that is moving in the modern world, legal issues. The result of data analysis such as Intellectual property, personal information in the past (Drexl, 2016) is an important indicator that data privacy should be legally protected, although technological advances are indifferent to legal regulations (Reed, 2012). Therefore, under the problem of copyright law of Thai society in the digital economy with the circularity of big data in the business sector, it is important to prioritize and set up rules and regulations that cover the security of personal information that may be leaking to public areas and may lead to legal privacy violations.

Data Security

Big Data analysis is the key force behind the drive to move the organization toward a changing digital world. The importance of big data is often exaggerated in terms of data security that may be interchanged or theft causing damage to the company. When big data is viewed as a business asset that helps companies understand their customers, it will impact on the development of organizational performance in the organization (Jarupreechachan, 2016). Nowadays, it is undeniable that the world is confronted with the problem of security, where data may not be carefully protected. Patterns of technology theft and data breaches in various forms indicate a change in the behavior of malicious users relying on technological expertise in data theft. These malicious people also have the characteristics of working as a network and have a market for sharing information and knowledge with each other. In Thailand, it is another country where hackers are gathered from the event where some bank data leaked to the outside.[24] These groups often use legal loopholes to break the security system. In line

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[24] By the end of July 2018, two commercial banks had found out that customer information was leaking outside. The banks had reported to the Bank of Thailand, accelerated the detection of causes, closed the loopholes, increased surveillance, prepared measures to take care of customers and shared information within TB-CERT. The Bank of Thailand had tracked and coordinated, enforced other offices, monitored, assessed and closed loopholes in the system, reported to Nation Cyber, had conference with the commercial banks and TB-CERT to summarize the lesson learned, including 1) Precaution, evaluate and test the system penetration regularly and patch it quickly; 2)Identify Attack Surface to prevent and detect; 3)Threat intelligence or CERT data exchange; 4)Prepare a plan for coping and rehearsing; 5) Prepare emergency statements; and 6) Communicate facts, transparency, taking into account target audience timing, responsible and coordinated third party (Bank of Thailand, 2018)

with the Cyber Security Threat rating, Thailand is at the top of the list in Asia. The public and private sectors are still oblivious to social media such as Facebook Line and Google that have access to both company and personal information. In practice, the law is just a means of social control that places emphasis on defining human and social behavior, but it does not intend to focus on technological mechanisms (Pagallo, 2013). Therefore, the government should give priority to establishing a comprehensive law on these issues in order to protect sensitive data on a stolen or being used.

Guidelines for the Success of Copyright Laws with Big Data

Due to the problem of digital copyright law in the digital age mentioned above, it is a major incubator for technological breakthroughs. By studying the big data management in the organization, the success of digital copyright law in the digital age under the framework of the EU's General Data Protection Regulation (GDPR) can be defined in three broad categories as follows.

Importance of Personal Data and Big Data

In the digital age, the emphasis on information should be pushed aggressively and continuously. That is, the government or relevant agencies should pay close attention to legislation that regulates access to personal information in the corporate sector. In addition, there must be a copyright law that protects big data of each organization effectively and concretely. The framework of the EU's General Data Protection Regulation (GDPR), Article 8(2) defines that personal information be treated fairly and based on the consent of the person concerned as required by law. (Pagallo, 2017). Personal data[25], according to the definition of GDPR, is information about a person, which makes it possible to identify that person directly or indirectly. The combined information can then be used to identify the identity of the person (Office of Electronic Transaction Development (Public Organization), 2018). It reflects the clarity of European personal protection laws, based on a strong foundation. That is, data controllers must obtain in the consent of the data subject to store his or her personal information, and define the scope, processing time, and data security measures clearly. In each country, information is strictly protected, especially sensitive information such as political opinions, religions, sexual behavior, criminal record, and more. Offshore companies must receive the same standards as European companies. Violators will be penalized by

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[25] Personal information as defined in GDPR include 1) name-surname 2) house address 3) e-mail such as name.surname@company.com 4) ID number 5) location data such as location information from cell phones 6) IP Address 7) Cookie ID 8) ID number for use in mobile advertising 9) medical records and other health information that can be used to identify a patient's identity, and 10) consumption behavior. Examples that are not considered personal include: 1) company registration number, 2) email address, such as info@company.com, and 3) anonymous information.

paying a fine of 4% of their worldwide earnings. It is a common practice in Europe and in countries where information or investment is shared with European citizens.

In the context of Thailand, there are no clear controls on how to focus on personal data and the exchange of big data through electronic media such as Facebook, Instagram, Line, and more. Forwarding or sharing information through electronic media, the personal identity can be easily identified, so the law must pay attention to the security of personal data. When the information is exchanged, the consent of the owner of the information must be obtained so that it can be used in accordance with the law. Creating a clear legal framework will lead to business transparency and accountability based on good governance[26]. Moreover, the consequence of the GDPR also covers three types of equilibrium practices that are appropriate for the context of Thailand. Such practices include 1) Competition system: When the law for the protection of personal information is strong and clear, data transmission would open to the competitive business sector. And they can see the opportunity to compete legally for their information resources or big data; 2) Coordination effort: big data is a co-ordinate point. As big data s only a part of the value creation process, coordination is needed to exchange information with other organizations or agencies to create the big data Project; and 3) protecting legal rights should not impede information technology research responsible for big data (Otterlo, 2013) or consider procedures to understand big data (Floridi, 2012). It is a form of capitalism in the digital age, focusing on providing competitive liquidity under the framework of copyright law that protects the movement of big data. These issues are very important for the development of new technological innovations that drive the economic system of the country.

GDPR also has the principle of Consent[27] to ensure fairness in the exchange of information, as big data is the opportunity of the digital world. Today, the focus on personal data and big data is being used to create startup[28] businesses both in the public and private sectors to solve problems using technology as a means of connecting to big data. Therefore, the government should focus on the detection of personal data and big data by providing a clear legal

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[26] Good Governance Framework is used in the administration of the land. The goal is to benefit the welfare of the nation and the people in accordance with the intent of Section 3/1 of the Administrative Regulations Act 2002 and the Royal Decree on Rules and Methods of Good Corporate Governance 2003. 10 principles include Responsiveness, Effectiveness, and Efficiency/Value for money, Equity, Consensus Oriented, Accountability, Transparency, Decentralization, Participation, and Rule of Law. (Office of the Public Sector Development Commission, 2011)

[27] From The owner of the personal information and meets the four criteria: 1) Freely given 2) Request for consent with specific objective 3) The owner of the personal information was informed of the data processing, and 4) The owner of the information must give his consent unambiguously. (Office of Electronic Transaction Development (Public Organization), BE 2561)

[28] It is a venture that starts small business, grows fast and leap, repeatable and scalable. Technology and/or innovation are key for building a business. It is often a business that comes up with ideas to solve everyday problems or see business opportunities that no one has ever thought or done before. (Naruet Worapongdee, 2016)

framework for data to be processed and stored in a large scale correctly (EDPS, 2016). It should also encourage all sectors to use big data in their own organizations effectively, gain new knowledge, and align themselves with the overall economic and social development of the country.

Development and improvement of copyright law in line with digital economy

In Thailand, the Copyright Act 1994 [29], which is copyright law, aims to protect both economic and moral interests (Thai Parliament, 2015). Although the government has amended the copyright law in line with the transition of technological innovation from time to time, it does not cover the violation of big data in the business sector. GDPR was in force since 1980. The law was changed again in 2016 to accommodate the fast-paced digital world; however, it has been seriously enforced in 2018. This allows the organization to adjust the timeframe to apply GDPR. Main objective, consistent to the context of Thailand, is to give citizens the right to control their personal information, which is a fundamental right and to provide the EU with a single standard of data protection for the free movement of information. General Obligations include 1) Free and Easy Access: Every country has to enforce the same GDPR to prevent confusion; 2) Notice and Collection: More severe penalties were identified. Violators must pay a fine of 4% of their global earnings, or more than € 20 million. Alert on accidental data leakage, data control authorities and data processors must notify the regulator and the public in 72 hours; 3) Consent: Requests for consent must be in a language that is easy to understand. Withdrawal of consent must be easy as well; 4) Uses of Personal Information: Data Subject Rights in GDPR extend the scope of data owner rights. The data control agency must inform the owner of the information that the information is being used for any purpose and must provide a copy of the information to the owner in electronic form, without any additional charges. 5) Data protection by designs and by default: Provide a personal protection system from the initial design of the service and provide Privacy-Friendly Setting. 6) Data Portability: People have the right to ask for their personal information from the operator to transfer that information to other operators. The information must be maintained by the Data Protection Officers (DPO) or expertise in data storage who can report directly to the executive. That is, companies need to hire a DPO to monitor large data processing activities and sensitive data, and do not declare data processing to the local data protection authority to ensure transparency; and 7) Right to be Forgotten: data owners can request the data control agency to remove their own data and to prioritize Privacy by Design at the initial to protect personal data leakage. (Prapanpong Kham-orn, 2016)

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[29] On December 21, 1994, it was enacted to replace the Copyright Act 1978, which was enacted on March 21, 1995 and amended on May 16, 2013 by the Office of the Constitutional Court. It is currently being updated on February 5, 2015 under the Amendment to Copyright Act (No. 2 and 3) 2015 by the National Legislative Assembly. (Thai Parliament, 2015)

One of the reasons that GDPR, which is European law, is being studied for the improvement and development of copyright law in Thailand is the large number of European customers. The review found that Thailand's large industries such as tourism, hotels, etc. have a large customer base coming from Europe. This resulted in the entrepreneurs have to adjust very much. If Thailand does not have a clear enough law, that means losing business opportunities. Moreover, if Thailand does not have a clear law that is equivalent to GDPR, it would be difficult to create a joint agreement between the parties. Since the problem is that in the exchange of information between European organizations and companies or agencies in Thailand, contracts must be created at a substantial cost per contract. As a result, small industries will not be able to compete equally.

Currently, the draft of copyright laws for the protection of personal data in Thailand is not comparable to the GDPR because of unclear interpretations or definitions[30]. It can be confusing to the public and agencies to apply. In addition, the values of Thai society look to the law as a tool to control behavior. In the case of copyright law, it is intended to protect personal information for business purposes. If the data is stored or exchanged legally, the public sector will play a role in driving the business to grow rapidly. From this point of view, the government cannot deny that participation in raising awareness of the importance of technological innovation affecting digital development in the country must be urgently undertaken. Improvement of the protection law must not hinder the development of technological innovation (Hart, 1961). The aim of the law change is to create flexibility in the use of law as the basic rules of the EU Data Protection Directive 46 from 1995 have created a significant challenge to technological development. For example, the Japanese government created a special zone for the development of robots and piracy testing, including live laboratories, or Tokku, the world's first robotic special zone. (Pagallo, 2013). It's an experiment that is legally allowed because it contributes to the country's technological advancement and consistent with the context of the changing global society. It is part of the development and improvement of copyright law in line with Digital Economy, where information technology or the Internet is used to create a career or economic activity, and communication and telecommunication technology also is used to develop business or industry sectors (The Secretariat of The House of Representatives, 2015).

However, copyright law is the key to protecting your personal information from abuse or unauthorized access. On these issues, if one looks at the context of Thai law, the drafting of the Personal Data Protection Act BE ..., then it is necessary to look back at the goals and the

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[30] Personal Data Protection Act, BE ...., under Section 5 of this Act, Personal data means information about a person that identifies the person, whether directly or indirectly, including all data which are or can be assigned to a person in any kind of way. For example, the telephone, credit card or personnel number of a person, account data, number plate, appearance, customer number or address are all personal data. (Suriyawongsakul, 2018)

general obligations of the GDPR whether it is compatible or not. As mentioned above, the definition in Section 5 of the term "personal information" is not as clear as it should be, compared to GDPR, about the identity of a person. The law of Thailand is a civil law system or a written interpretation. If the definition is wrong or not covered in the first place, it will result in misuse and inconsistency with the objectives. For this reason, the improvement and development of copyright law in Thailand should begin with the definition in the Privacy Act, which is clear and easy to understand. The focus should be on the flexibility of law that does not hinder the development of technological innovation and the transfer of big data. It must also be consistent with the Digital Development Plan for the economy and society.

Production and Development of Big Data Professionals

Changes in the digital economy indicate a fundamental problem in the analysis of the big data, which is the lack of qualified personnel in analyzing the big data. The science of data analysis is still a new topic in Thai society and it is difficult to find people who work in this area. Despite the technological advances using artificial intelligence (AI) and the brain's AI or Machine Learning to analyze big data in the organizations, but they still needs qualified persons who are able to describe the relationship and the reason for linking data, that AI and Machine Learning are not able to do so. In addition, The European Union (EU) expects companies to develop a platform for gathering and analyzing big data, which consists of two main approaches: 1) Using the information to maximize the benefits by developing a prerequisite for receiving large data, the companies should ensure that they create value safely from the data without violating the law; and 2) Promotion and implementation of data quality standards for the company to be credible in the use of modern technology by creating a European framework with data links and clear guidelines for utilization (European Commission, 2017). With the current trend of big data, the Thai educational institutions are realizing the direction of labor migration to the digital world. Management guidelines can be defined as follows.

3.1) 3) Production of big data Professionals: At present, many educational institutions are attempting to launch curricula in the science of data analysis, but at the same time, many institutions ignore change and remain focused on teaching using data structures and the traditional database system, resulting in the production of graduates rarely meet the needs of the digital industry. At present, the big data is taught at the master's degree level and is focused on conducting research. However, the foundation of big data learning should start from the bachelor's level (in all fields). Since modern technology evolves into a viable part of life, the study is to prepare the labor force in line with the economic development of the country.

3.2) Development of big data Professionals: Educational institutions may be both the producers and developers of the big data expertise, but true human development needs to be coordinated with many sectors that are in line with the country's economic development direction. The focus should be on the development of personnel within the framework of the big data related roles. It is divided into 3 parts: 1) Data Engineer: a person responsible for managing the whole system; 2) Data Scientist: a person finding the relationship of information or a new solution from in-depth analysis (Leek, 2013) and 3) Data Analyst: a person responsible for data entry and data analysis, both in real-time or analytics data, to present and benefit the organization (Kulwanitchaianan, 2018). All roles are related to data processing[31] and Privacy by Design[32]. In addition, the development of personnel related to big data must be in the form of networking parties to meet the development direction of all sectors. And they are an important part in driving technological innovation to create a new dimension of driving the country.

Recommendations

1. The government must develop a network of partnerships with various sectors to support investment in technological innovation needed to drive the country's economy. The focus should be on 1) Investment on Data: Useful information gathering and data extraction for each agency; 2) Investment on System: Development of the platform for the adoption of the agency, and 3) Investment on Personnel: Development of the capability of personnel in government agencies to align with the development direction of the country under the digital economy.

2. The government must focus on the production and development of capable personnel in the field of big data. It should encourage public, private and public sectors to cooperate in a networked manner. That is, the educational institution must lay the foundations and promote the technological knowledge to students by cultivating values, lifestyle and collaboration in the digital age. This includes the development of personnel based on the role of big data, including data engineers, data scientists, and data analysts. Network partners should be used to guide production and development in order to meet both the industrial demand and the country's economic competitiveness.

3. The government must develop and improve the copyright law, starting from the definition in Section 5 of Personal Data Protection Act, The definition should be clear and cover economic activities. The law should be flexible and consistent with the development of

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[31] There are 3 important roles. 1) Controller: determine the purpose and method of processing; 2) Processor: process data by objective and method of data controller; and 3) Data Subject. (Office of Electronic Transaction Development (Public Organization), 2018)

[32] Data controllers who take into account the privacy of the data owner at all stages of design and maintain throughout the process. (Office of Electronic Transaction Development (Public Organization, 2018)

technological innovation in the country. It should regulate access to personal information through the consent of the data owner and protect big data's use in both public and private organizations. Rules and regulations must conform to the framework of law that does not hinder the development of technology. In addition, they must be clear and able to fill the loopholes of the law.

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