# EXPECTATION THAT INFLUENCE BIG DATA USAGE OF SMES BUSINESS ENTREPRENEURS

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**EXPECTATION THAT INFLUENCE BIG DATA USAGE OF SMES BUSINESS ENTREPRENEURS**

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ABSTRACT

The objective of thematic paper is to analyze the expectation of SMEs' entrepreneurs which relates to Big Data usage in their businesses. The in-depth qualitative interview was conducted to each of the 25 SMEs entrepreneurs to collect data to figure out about expectation for using Big Data. Findings from the research has shown that most of SME entrepreneurs in Thailand presented the interests in Big Data and believed that Big Data was the necessary technology for organizations. Implementing the technology and transforming their business into digital business helped their business in a long run. Some SMEs traditional businesses have started to adjust their businesses to online channel. The result identified that entrepreneurs provide the different priorities of their expectation to use Big Data from various business areas. The first rank of SMEs entrepreneurs' expectation is to create the personalized experience for each customer. The second ranks of SMEs entrepreneurs' expectation is to set the effective price. The third rank of SMEs entrepreneurs' expectation is to turn visitors into customers. In aspects of factors relating to Big Data usage, researcher found that there were several factors related to demographic characteristics. In point of entrepreneurs, the factors that related to big usage are money, data source availability, and people respectively.

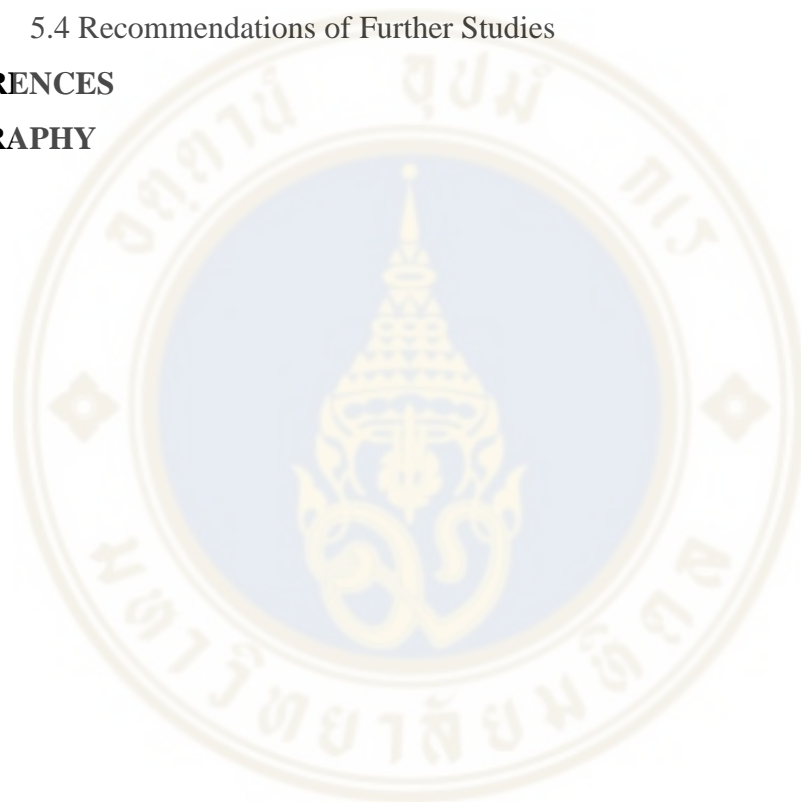KEY WORDS: Big Data/ Adopt/ Technology/ Expectation/ SMEs

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# CHAPTER I

# INTRODUCTION

## 1.1 Background and Problem Statement

Presently, the data which refers to the quantities, characters, or symbols becomes natural resource which is generated from everywhere. The system that is stored and transformed in the form of electrical signals and mechanical recording media. Is what proceeds the data? For business, in order to support the goals, data can contribute to the value in many ways. To gain competitive advantages in the market is firstly to understand the data (Riley, 2019).

Matthew (Matthew, 2015) stated that Big Data is a data collection in large volume. According to Iqbal (Iqbal, 2018), Big Data characteristics can be explained with 3V; large Volume of data, Variety of data formats, and Velocity of data processing. Practically, complex dataset such as the total shared comments on social networks and websites, personal information with multiple formats is unable to be sufficiently collected by human beings. Therefore, it has relationship with Big Data analytics that is performed by software specifically designed to help business understanding on customer needs, reducing time, making better decisions, and predicting other advance accelerative analytics (Matthew, 2015). To increase the growth rate of organizational performance, to achieve organizational needs, and to maintain sustainable success are the purposes of Big Data.

According to Robinson's research (Robinson, 2012), SMEs failure can be from causes and the bargaining power is the major one. Smaller businesses can rarely compete with larger organizations especially in pricing negotiation. Enjoying the preferential pricing from their business partners is the nature of large organization. Another cause of failure is lacking of business plans as a lot of companies fail from lack of understanding in their business including the mission and strategy. What are often created from inaccurate information which get poor decision making of the executive are the unclear and unrealistic business strategies. Inaccurate market analysis such as

preferable customer target, competitive advantages, or demographic area that can create more profits are the result from the absence of necessary data. The incredibility in term of investors' perspective related to monetary analysis of business because of high risk is also the result of lack of planning.

Another cause of failure is poor government policy execution. The government provide many good policies in developing countries to stimulate better SMEs, but poor policies implementation make it is impossible to realize the goal (Ogbuokiri, 2015). Therefore, it is important that SMEs should identify clear and more realistic strategy in order to be able to aware of sustainable growth in the long run.

The additional cause of failure is insufficient use of technology to improve the process. SMEs has the poor and insufficient significant information storage technology for the operation and management perspectives. It related to inaccurate product's material management. The deficiency of most SMEs businesses' accounting system serves to substandard process and inability to evaluate internal organization performance. These causes might contribute mismanagement and consequently become enterprise failure. Finally, in term of insufficient expertise management, owners have small necessity skills (Ogbuokiri, 2015). The research showed that only 20 percent of new companies can survive their first year of establishment. Furthermore, the other 50 percent of new enterprises would fail within first 5 years (Daniel, 2019).

Regarding SMEs business problems mentioned above, they face with difficulties for the rapid growth or to compete with big company in the market or gain more potential customers. In addition, it usually takes long time to achieve market competition due to the limitation of research budget, resources and modern technology to provide information about customer behaviors, sales trend and strategies plan. Meanwhile, governments regularly support SMEs and provide incentives, plus favorable tax treatment and loans approaches, to support sustainability of SMEs business. Small and Medium-Sized Enterprises can gain country living welfare because SMEs growth helps increase GDP, reduce unemployment and finally increase revenue from taxes. Trend of today, 20 percent of working individuals have their own business, and 30 percent of laborers are employed by other companies (Bumblauskas, 2017).

As the risk of SMEs business failure, owners see the advantage of using Big Data in their business. Furthermore, the study will focus on expectation of SMEs'

entrepreneurs with their aims to use Big Data and analysis of the aspects to increase this demand. Also, the increasing demand of Big Data adoption in organizations is very enthusiastic for workers' high skill and knowledge. The bridge of expectation between processes and analytics when the large volume of data arrives is significant to accurate decision making as propose of using Big Data. The meaning of expectation is a belief, feeling of forward-looking parties to something that should be or should happen. As the expectancy theory, the performance outcome comes from aware options among variety of choices and aims that are the highest delight and lowest pain. Regarding Edward Lawler and Lyman Porter, Victor Vroom indicated that the relation between people behavior at work and their targets were not as the first assumption. The cause that impacts people's performance is independent based on person such as personality, capability, and background. Despite their different goals, they can be inspired if they believe in the good interaction between effort and output.

In term of SMEs owner, to develop their ineffective business processes, poor performance and the failure of location area design and decorate can be solved by the Big Data to understand customer behavior or seasonal trend based on their purchasing history until they can reach customer satisfaction within limitation of budget, area, time and resources and create customer loyalty in the long run.

## 1.2 Research Objectives

This paper aims to analyze the expectation of SMEs' entrepreneurs which relates to use Big Data in their businesses. Every business expects to gain the market competitive and market survival in the long run. However, SMEs' entrepreneurs have many concerns if changes occur. It related to decision making in the process selection of Big Data usage in their business. It shows Big Data strategy for organizations that are aware of the transformation in digital age. How Big Data can help SME's entrepreneurs is also analyzed in depth to make predictions and to plan various business operations with the benefits of Big Data for SME entrepreneurs.

## 1.3 Scope of the Study

This study focuses on investigating business owners' perspectives of Big Data usage in their businesses and acquiring their interesting views about using Big Data.

# CHAPTER II
# LITERATURE REVIEW

It is interesting to know the benefits of Big Data usage for SMEs and the expectation of using Big Data in SME entrepreneurs' aspects. In this section, the review of related literature and studies are presented in the following order:

## 2.1 Definition of Big Data

Big Data is data in the large size. It is everything starting from the information that is stored in any format such as the URLs that are bookmarked. The definition of Big Data does not include how the data is classified, distributed, or analyzed, but it means a lot of information regardless of the format (Wang & Zhao, 2017; Shah & Sharif, 2017). Regarding Big Data characteristics, it must consist of the following features that can be observed which are 3V.

First, Volume means the large amount of data that can be collected and potentially contain meaningful information. Second, Velocity, the term Velocity denotes the speed at which the data is delivered and/or to be processed to ensure that the data is still relevant to the needs. Two types of velocity related to big data are the generation recurrence and the repetition of operating, logging, and distributing. Velocity is the significant component of Big Data as customers expect that the available data should be able to timely support their needs and upon their requests. The last feature is Variety which means the variety of data formats and sources. Big Data helps effectively analyze and obtain the insightful results from variety of data format and data fusion such as text, picture, audio, etc (Muhammad, 2018).

## 2.2 Benefits of Big Data

From the concept of Big Data mentioned above, Big Data analytics is the process of collecting, organizing and analyzing large sets of data to discover patterns and other useful information. Big Data analytics can help organizations gain better understand of the information within the data as well as identify important data to the business and future business decisions, and manage many innovative data analytics technologies (Ogbuokiri, 2015).

- **High-Performance Analytics**

To analyze a large volume of data, Big Data analytics is performed using specialized software tools and applications for predictive analytics, data mining, text mining, and forecasting and data optimization. Collectively these processes are separated but highly integrated functions of high-performance analytics. Using Big Data and software enables an organization to process extremely large volumes of data that a business has collected in order to determine which data is relevant and can be analyzed to drive better business decisions in the future.

In term of purchasing, customers purchasing history can be brought into customers buying behavior and store management analysis. For example, the benefits of data analytics include identifying what type of goods customers are looking for, how often customers repurchase (monthly/weekly), what motivates customer to purchase more, etc. This helps increase sales volume based on marketing campaign such as sales promotion that fits customer personalization. In term of store management, the Big Data analytics can indicate useful suggestion on how to properly locate the product in the store that can maximize product sales. This can be achieved by knowing the heat map, i.e. the location in the store where customers often visit and stop.

- **Intelligent Decisions**

Big Data possesses the potential to help companies improve operations as well as faster and more intelligent decisions. The data is collected from numerous data sources including emails, mobile devices, software applications, databases, servers and other means. This helps company gain useful insight to increase revenues, get or retain customers and improve operations.

The current usage of Big Data applied in business operations is increasingly important. It is more important than in the past because of the variety of customer

behavior and more specific customer needs required. The businesses have applied Big Data into their business operations to be more responsive to customer needs by using Big Data to analyze behavioral groups or respond to the changing behavior of customers.

From the application details of Big Data above, it shows that technology is important to the success of the SME business. Hence researching in Big Data and its benefit in business is necessary in this digital age.

## 2.3 Concept of SMEs

### Definition of SMEs

To answer the question of "What is SMEs", SMEs or Small and Medium Enterprises are the limitation of worker & financial turnover. However, SMEs have the difference definition in each country, some countries define it based on the number of employees in the organization, while other countries define it based on the capital on the plant and machinery in the organization (Nowotarski, 2017). The idea of SME business is to focus on expanding the existing products in the market and to increase the number of customers and better respond to the customer's needs. Productions still use the existing and not so advanced technologies. In addition, we see the word SME and SMEs, which many entrepreneurs may have question if they are different or not. They are not different because both of these words have the same meaning and short for the same word, small and medium enterprises (Wang & Zhao, 2017; Baharuden & Ameen, 2019).

### Classification of SMEs

SMEs could have many meanings. One of them is what the law requires by the promotion of small and medium enterprises Act B.E. 2000 giving the meaning of SMEs for various business types as follows (Callot, 2017):

1. The production/service-related business with a fixed asset value of less than or equal to 200 million baht and hiring less than or equal 200 employees. The manufacturer of the product groups means company use equipment or freehand to contribute unchangeable objects into a new product. The services business means an

organization that provides services to customers such as entertainment, personal services, etc.

2. Wholesale-related business with fixed assets of less than or equal 100 million baht and employing less than or equal 50 employees. The wholesale companies are companies that sell goods to retailers, industrial unit or wholesalers themselves.

3. Retail-related business with fixed assets of no more than 60 million baht and hiring not more than 30 employees. The retail companies are companies that sells unprocessed products to customers.
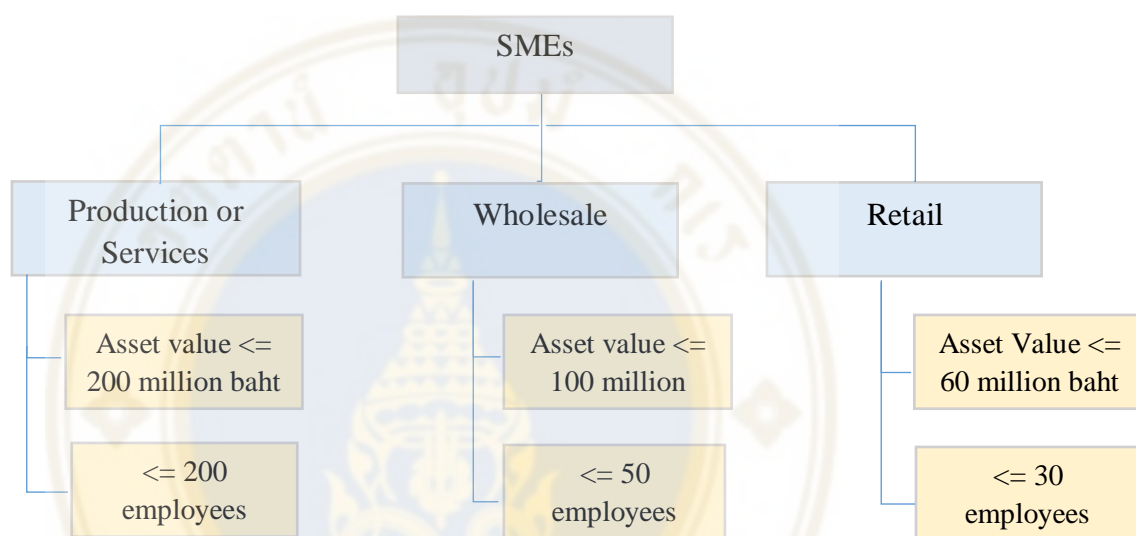


**Figure 2.1 Classification of Small and Medium Enterprises (SME)**

## 2.4 Concepts of Business Development

Business Development is the methodology of increasing revenue and strengthening customer relationship. It can be developed from internal resources such as the collaboration across department or external environment between partners and companies in the marketing. There are three main objectives driving business development success to win the hearts of customers and being an influential tool to build up good image, gain profit, and build long-term stability (O'Connor & Kelly, 2017).

1) To develop the business sustainable

Regardless of business type whether it is a manufacturer or a trading business, if business owner considers only the price and quality of the product, and do

not pay attention to the working environment of employees including environmental impact, the chance of the business being unacceptable among consumers is very high. Especially in this era where online communities can be accessed easily. News and information can be spread quickly. Business owners have to continuously change both their ideas and new business plans in order to ensure that the business will grow sustainably (Baharuden & Ameen, 2019).

2) To create business opportunities

It is illustrated that consumer behavior around the world is becoming more interested in green products or environment-conscious business and services every day. Turning or developing the business towards environmental conscious business can create opportunities for business and expand new customer base (O'Connor & Kelly, 2017; Baharuden & Ameen, 2019).

3) To mitigate the risk

Developing a bile business for both society and the environment helps prevent risks arising from conflicts or problems with the community, customers, and related parties. There are many evidences showing that when a company fails to do so, it may drive to loss of credibility, income, and being opposed by society (Baharuden & Ameen, 2019).

In order to see the business development results, the performance must be monitored by collecting data and comparing before / after in order to find the issues that need to be improved. Organization development is illustrated for stakeholders both inside and outside the organization through annual and sustainability reports. When receiving various feedback from stakeholders, management must bring that information to review and check if it can be used to develop and improve the business for sustainable growth. The good business owners should see development for sustainability as "opportunity" for every business to adapt in the term. The goal of a successful business may not only be a lot of profits but also the cooperation of business owners and stakeholders in every dimension. That is what bringing "The true sustainability of doing business" forever.

## 2.5 Big Data Adoption for SMEs

Currently, SMEs in Thailand that are successful in implementation the application of Big Data having the following characteristics as follows (Vajjhala, 2016):

1) Adopt Cloud

Deploying tools on the Cloud such as CRM, project management software, file storage, backup, customer service, and accounting system will help you work on information more easily despite of being small organization like SME or Startups.

The idea of using Cloud tools is that everyone can access the working files publicly to save time in sending files to different users, reducing the business costs of system installation by switching to using tools available on the Cloud instead. This method also allows the viability data storage from all parties.

2) Assess the work within the organization

Before companies analyze the data seriously, many small organizations are not interested in evaluating their performance because they are focusing on the purpose of the work, the business target and the various efficiency. Unless the company contains a lot of data. To use Big Data, the first thing that is needed to think about is measuring the objective as SMEs businesses have the advantage of getting close to their customers or go openly to collect information from customers. Therefore, if they have clear objectives, the collected data will typically be quality raw data.

It is not surprised that for large businesses, Big Data is a tool that helps them get closer to their customers because Big Data can provide efficiency in analyzing data.

3) Know what kind of answers are being sought

In fact, everyone is able to access to enormous amounts of data. Therefore, it is a testament and a challenge for SME or Startups to know what is the hidden benefits of that huge amount of data. Appropriate analysis is more important than the amount of data. The trick for small businesses is to know what are being looked for or know what kind of answers being sought. One of the great ways to analyze data for small businesses is to put yourself in it and take actions.

4) Explore information all around

The first part that is suitable for starting operations is internal. Before obtaining the information available, one should not be bothered by being obsessed with choosing new tools used to make Big Data. A Dashboard of key performance indicators

should be created, then install small utilities to help access information in real time. It allows the evaluation of basic information such as generation, ad convention and budget per capita for finding new customers to happen because they cannot get a sophisticated system without a solid foundation if a framework and indicator of success have not yet been created.

5) Hire additional personnel with the right man in the right job

Personnel in data mining and data analysis are the people that should be looked for. However, it is understandable that people are naturally talented and different as some are good at numbers, while some are more skilled at art. Every business needs additional manpower; especially, in Big Data jobs that require people who can see what is hidden in the data which is shown randomly in various display charts and graphs. In practice, this group of people should know how to install and write code, read Profit and Loss Financial Statement and create workflows allowing the ability to create, track and evaluate the company's performances.

Regarding Vajjhala's research (Vajjhala, 2016), Big Data helps gain strategic competitive advantages for SMEs; however, it often has limitation due to the lack of sufficient fund to spend on the modern technology and worker. Many Big Data challenges still exist especially in computer system containing big computing power (large CPU) but without much capability in taking data in and out (poor I/O). Cloud computing helps prevent the requirements to maintain expensive computing hardware and software. Its resources and techniques have advantages to solve the traditional problems correlated with fault tolerance and low performance causing bottlenecks in using Big Data. SMEs may take benefit of cloud computing techniques to leverage the benefits of Big Data without important investments in worker and technology. This research analyzes the current trends of using cloud resources from Big Data area and how SMEs can take benefits of these technological trends. The results of this study will avail SMEs in analyzing, researching achievable opportunities, and also comprehending the challenges in using Big Data. Moreover, Abdillah (Abdillah, 2017) studies that modern digital lives have been contributing all data in enormous amount by using new approach as cloud computing. The combination between Big Data and Cloud Computing have been used by SMEs. Smartphones is the dramatically starting point of dissemination of the applications to customers in many areas. Three most popular

businesses of Big Data and cloud computing adoption are travel agents, market places business, and transportation with online channel. The results show that Big Data and cloud computing adoption increase huge achievement for SMEs. According to Frizzo-Barker (Frizzo-Barker, 2016), there are three causes for SMEs to adopt cloud computing; hardware cost reduction, processing cost reduction, and capability in analysis in power of Big Data. Because SMEs have the limitation of resources and without the ability to invest the high cost if Big Data is adopted in house. They could also benefit from the low investment and reliable cloud computing framework. In addition, Wanamina researches (Wanamina, 2019) that forecasting accuracy is the main reason for using technology in the future. In addition, perceived expectation, efforts, and credibility of using technology have a relationship with impact on future technological intentions. Moreover, Baharuden & Ameen extend that the previous knowledge may be outdated and unrelated in the age of the digital economy (Baharuden & Ameen, 2019). "Industry 4.0" offers organizations the flexibility in financial transactions and operations, so the companies need to embrace technology emerging.

On the other hand, Coleman (Coleman, 2016) describes obstacles of SME in up taking Big Data analytics and it recognizes their complicated demanding to all shareholders, including domestic and foreign policy maker, Information Technology, data science and executive communities. It describes that Big Data is large information and huge organizations in all segments are making important progresses in relationship of consumers, products, and advancement. Accordingly, profitability through using this beneficial product of SMEs is proved to be slow adopter of using new technology of Big Data analytics and is in crisis of being left behind. In Europe, SMEs are an important sector of the economy and the challenges that they confront in wishing to be conducted urgency.

The study of Big Data Adoption shows that SMEs nowadays are increasingly collecting data. Currently, the business operations of small and medium businesses (SMEs) is extremely important to use the enormous amount of customer data. Even they are restricted with the limitation of fund, resources, and knowledge of technology skill to adopt themselves with modern technology. The data has been integrated and applied to data technology in order to use the said customer data to be processed for business operations and analyze customer behavior in response to more

specific needs. And also, it is used to improve marketing strategies in business operations.

## 2.6 SMEs Technology Adoption based on Industry

A fast-technological advancement has played essential role in every business. SMEs have been trying to start using information technology to gain competitiveness in the market. However, Wahid (Wahid, 2007) found that SMEs have not paid their too much attention to technology as should be for three main reasons. Firstly, technology usage is not part of their work or required to support their routine work. Secondly, insufficient fund is another reason why SMEs have not adopted technology with high price. Finally, lack of human resources capability in technology prevents SMEs from technological investment.

In the meantime, Nugroho (Nugroho, 2017) studied that businessmen in craft and tourism industries have not understood the benefits of technology usage and hence have not prioritized technology adoption. Some entrepreneurs have already adopted technology for achieving an online market. Hence, it reduces the process that relies on the human resource readiness. In addition, the industry type and size of company do not affect technology adoption in business operation. One of the problems that causes anxiety among handcraft companies is publishing unpleasant information or making the available data is prone to make their competitors easily imitate their product or service. The significant criteria of factor in using IT of businesses that have not experiences in technology includes easiness to use and reasonable cost. Therefore, the level of recognition in advantages of technology will encourage entrepreneurs to use Big Data.

In the agriculture and food sector, O'Connor & Kelly studied that knowledge through Big Data filtering could be clearly and continuously increased when SMEs have access to a program that can analyze packages and explain the analysis of large-scale consumer data captured in the food network (O'Connor & Kelly, 2017).

In context of HR, Shah researched that the application of context for Big Data within the setting of the HR case study was accomplished through the improvement

of a prescriptive model that explores to encapsulate worker behavior and mindset of preparation in the change situation of organization (Shah, 2017).

In medical business, Wang conducted a study with purposes to adopt a medical data analyst's point of view into medical Big Data processing techniques. The results showed that the benefits, perceptions of community and attitudes were significant for the purpose to adopt large-scale pharmaceutical knowledge processing techniques and the straightforward impact of the observed benefits on the relationship and social perspective (Wang, 2017).

Technology Adoption for each of business industry that have been studied showed the different perspectives in each business. It showed that in each of business industries what the considerations to adopt technology in their business are.

## 2.7 Conceptual Framework

With the researcher's efforts, this study focuses on investigating the entrepreneurs' expectation for SMEs business and the benefits of using Big Data can be varied in each organization, considering criteria for implementing Big Data in business with high challenges and opportunities, and understanding the technology adoption readiness aspects based on industry type. From the study of related concepts, theories and research above, the researcher would like to adopt the following conceptual framework below.

First step is conducted to know the benefits for using Big Data. Then in second step, the researcher tried to understand expectation of business goals in terms of SMEs entrepreneur aspects, how Big Data can fill in to support their business goals. Then in third step, it needs to understand criteria in Big Data implementation for SMEs business. In the final step, the researcher tried to classify technology adoption readiness aspects based on industry to realize the difference perspectives in various industry.
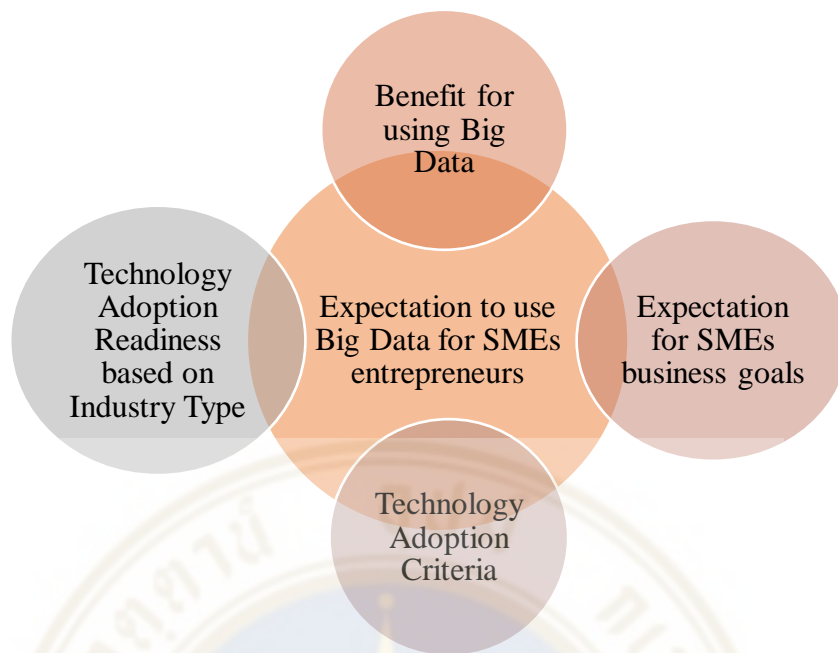
**Figure 2.2 Relation between the Entrepreneurs' Expectation for SMEs Business Goals and Benefits of using Big Data**

# CHAPTER III
# RESEARCH METHODOLOGY

The qualitative methodology is used as a research design. A qualitative research is one of methodologies for this research design. It is one of the traditional research methodologies used to speculate evidence for theory through the information gathered from people, in-depth interviews to explore the expectation that related to Big Data usage for SMEs entrepreneurs (Creswell JW, 2011). In this qualitative research, semi-structured interview is conducted through one-on-one interviews with the participants (Creswell JW, 2011).

## 3.1 Population and Sample

The sample of this study consists of 25 key informants who are SMEs business entrepreneurs. The scope of this study is to choose different business areas to obtain several business aspects from various entrepreneurs and to prevent the bias of information if all were from same industry.

## 3.2 Measurement of Variables

The researcher collected data from open-ended interview questions. Interview was conducted to ask open- ended questions the interviewees in qualitative research. Data collected were used for developing the thematic interpretation (Creswell JW, 2011). The questions were relevant to expectation that related to Big Data usage for SMEs entrepreneurs by studying from related concepts and theories from documents and research. For the interview preparation, the researcher prepared knowledge regarding qualitative research methods, and gain understanding of research methods that would bring to this comprehensive and accurate study of the content or issues. Moreover, interviews were encouraged to allow participants to reveal their feelings and

perceptions. The interview questions consisted of three parts, starting from information regarding interviewees about demographic data. The next part consists of general information of business. The final part describes key questions which collect expectations' information that related to Big Data usage for SMEs business entrepreneurs. More details of the interview are as follows:

**Part 1: Demographic Data of Interviewees**

In the first part, the objective is to understand demographic information of the respondents.

- Age

**Part II: General Information of Business**

In the second part, the objective is to gain further understanding and insight of SMEs' entrepreneurs in terms of expectation to use Big Data. The following points are significant and related to the results of this research.

- Industry
- Business establishment (years)
- Number of employees

**Part III: Key Interview Questions**

For this part of the questions will conduct an interview to answer the research objectives in 2 important areas, namely advantage of using Big Data in business, and expectation that related to Big Data usage. So, the questions of this interview contribute to the results.

Q 1: Provide your opinions related to Big Data concept.

Q 2: Provide your understanding about the advantages to use Big Data for your business

Q 3: In addition to knowledge and advantages of Big Data, what is your opinion of adopting Big Data in your business and why?

Q 4: What are the considerations relating to decision making to adopt Big Data in your business?

Q 5: If business is ready to use Big Data, what is the change management?

Q 6: Provide your expectation of using Big Data.

## 3.3 Data Collection

The methods of collecting data are divided into 2 parts, namely data type and data analysis.

### 3.3.1 Data Type

There are 2 data types which are used for this research below:

1. Primary data: qualitative research was used through in-depth interview with 25 key informants who were SMEs business entrepreneurs.

2. Secondary data: For the knowledge of Big Data and SMEs, the researcher studied and collected various information from related journals, articles, books, related researches, and general information of business in order to determine the scope and content of the research, and create research tools according to the research objectives.

### 3.3.2 Interview Analysis

In this step, individual interview was conducted with SME entrepreneurs in Thailand. The process was set in the step below (Ashraf, 2017):

a) The researcher recorded various data that were relevant to the research in order to gain clear information and contact SMEs business entrepreneurs for interviews to analyze about their perception, feelings, and attitudes regarding their experiences in difference business areas.

b) The researcher collected data by phone calling between the interviewer and the interviewees to reveal important information. The researcher would define the questions. The first interview question will start with demographic data's question of business' owner such as age and gender, then the following question is about general information of business such as industry, number of employees, and company history (years). Before the interview was started, the researcher requested permission for note taking and audio recording with the purposes of the interview.

c) The researcher conducted brief notes only on important issues, and recorded in interviews. During the interview, the main point of questions is asking about their perspectives in term of advantages of using Big Data in business, change management when starting to use Big Data in your business, and Expectation when

investing for Big Data and see their opinions. At the end of the interview, the researcher summarized the data immediately.

d) The researcher wrote the sentence-by-sentence from recording.

e) The researcher checked the reliability of the data (Dependability) by taking the information from the interview.

## 3.4 Data Analysis

The qualitative research mainly focuses on lectures and explicit observation by collecting information from well-selected people. The data has been analyzed to support research because it is a clear and firm answer. Synthesis of research data perform content analysis with the following steps (Ashraf, 2017).

a) File classification of data obtained

b) Information and field notes are brought to be read multiple times to gain an overall understanding of the data obtained and consider important issues

c) Information are read again. In detail in every line, interpreted and extract important messages or sentences related to the expectation that related to Big Data usage for SMEs entrepreneurs with important principles to be considered.

d) The same message or sentence with the same or similar meaning to the same group are brought by reading and reviewing the primary data in the form of textual language which has been collected from various sources in the field, then divided the data into separate (Breaking Down) according to the meaning or analysis unit at the initial level. After that, define short texts to be used as concepts or summaries of concepts that reflect important meanings. Both obvious and hidden in that subsection, then bring the summary of concepts that have similar or different meanings into a group of concepts, summarizing the concepts into a meaning unit of information that is larger.

e) The researcher writes to describe the findings thoroughly and clearly of what they explained. With no theory being taken to control the occurrence as well as giving examples of key words that have been to show the clarity of the phenomena that occurred.

# CHAPTER IV

# DATA ANALYSIS

In this chapter, the results of interviewing 25 SMEs business entrepreneurs are discussed. This chapter mainly tries to find the expectation that related to Big Data usage for SMEs entrepreneurs that are evaluated using a qualitative research method. It has started with the demographic data of interviewees. Moreover, it has followed by observation findings that are separated into three significant parts.

Part 1: Advantages of using Big Data for SMEs business entrepreneurs

Part 2: Discussions of using Big Data for SMEs business entrepreneurs

Part 3: Factors that related to Big Data usage for SME entrepreneurs

## 4.1 Interviewees

25 interviewees are regular SMEs business entrepreneurs. Phone calling with one-to-one conversation was conducted to collect data. These interviewees from various business fields were selected to obtain different perspectives and their intended use of technology. The researcher would like to find out what expectation related to the Big Data usage for SMEs entrepreneurs.
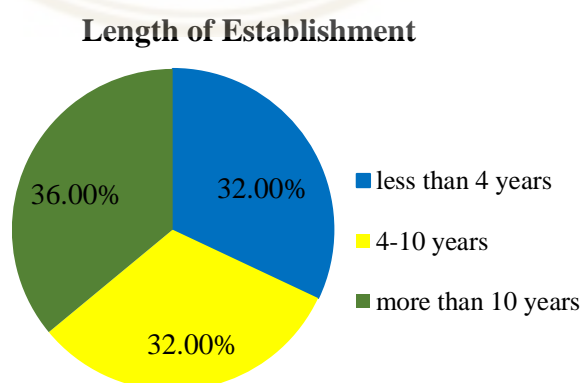
**Length of Establishment**



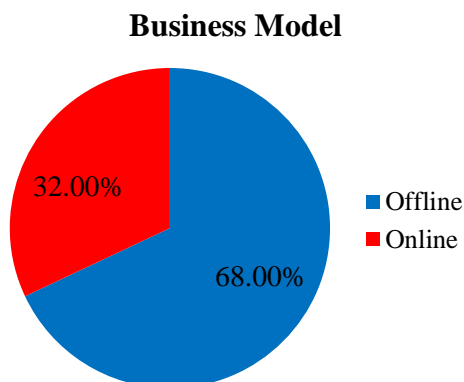**Figure 4.1 Participant's Establishment**

**Business Model**



Figure 4.2 Participant's Business Model
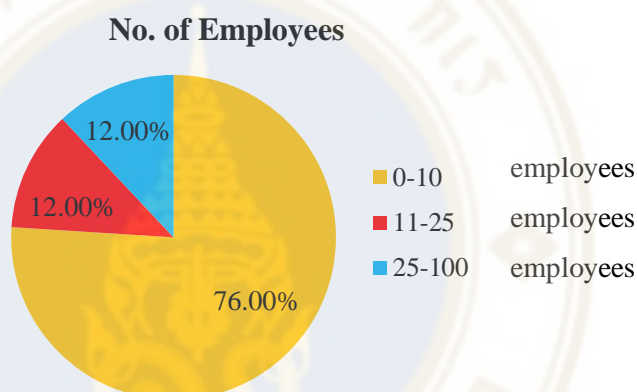
**No. of Employees**



Figure 4.3 No. of Employees

According to the above diagrams, the business establishment length of each participant was similar. Most of them had length of more than 10 years.

In terms of business model, the industry was divided into 2 business models. The first business model was brick-and-mortar or offline company such as earphone shop, clothes shop, food store, Royal Project Foundation (food and café) shop, customize and repair of motorcycle shop, flower store, cosmetics shop, construction company, jewelry shop, paper company, bread store, luxury car, infrastructure and consultant company, etc. The other business model was online company such as skin care, clothes shop (second hand), gift shop, contact lanes and eye. Most of participants interviewed were offline business (68%).

In addition, the researcher would like to represent the number of employees as the proxy of company size, including small, medium, large business. 76% of the participants employed less than 10 employees. 12% of the participants employed 10-25 employees. Similarly, 12% of them hired more than 25 employees.

## 4.2 Observation Findings

Regarding interview findings, it was found that most of interviewees had the knowledge about the meaning of Big Data, but lacked of clear definition. Based on their understandings, Big Data is information with huge size that is collected from internet or the system further. The data format of sources can be text, picture, and video. For example, the information is created on social media from billions of people around the world such as Facebook, YouTube, Google, etc. It can include data produced from tens of billions of sensors around the world such as time stamp, GPS map. The data can be analyzed in each of requirements, helps forecast in every aspects of businesses, find out the hidden emotions of people and helps increase confidence to entrepreneurs for any investment for making decision.

Currently, all of participants replied that the current practices to collect the data in their businesses are excel or simple technology with cheaper cost. Based on their feedback of using the existing technology, most of them were pleased with the results when compared with the cost. However, they were interested in gaining the benefits of using Big Data and thought that they might use them in the future if they had many branches or online business with many customers that will generate much more complicated data and processes. Some of them invested in modern technology such as AI to reach customer targets such as sending discount coupon in Shopee, broadcasting the advertising to people who are interested in their products and have no intention to buy it now.

**Part 1: Advantages of using Big Data for SMEs business entrepreneurs**

Based on SME entrepreneurs' perspectives, they realized that there are many advantages of using Big Data. Most businesses thought Big Data is very helpful especially online business. Some SME traditional shops, including wholesalers or

retailers may start to adjust their ways towards selling products online. They foresee that the benefits of analyzing data in depth can help make predictions and plan various business operations for SME entrepreneurs in doing business. In SME entrepreneurs' thoughts, the main advantages of using Big Data in business can be summarized as follows.

Firstly, one of benefits is to understand consumer behavior. In term of in-depth understanding of consumer behaviors, the advantages of using Big Data for SMEs are to extract knowledge or to find out the hidden meaning to gain competitive advantage because consumers have more complex needs. Entrepreneurs need to know about customer behavior such as the time, day, and month when customers often buy the product. Then, the results can be used in preparation step for goods and resources that meet customer requirements. Big Data helps manipulate the data structure as entrepreneurs' requests, helps online retailers to communicate, to create experiences, to give proposals customize to individual customers, and to create new business opportunities. In addition, it helps separate customers into various target groups such that our marketing messages can be more personal and not making disturbance to customers who are not interested in this product. It also retains the loyalty customers with the motivated promotions to repurchasing. "It seems that businesses have their own loyalty card to get more in-depth information for each customer. They have known what/when make this person motivate to buy their products", interviewee no. 7 (Royal Project Foundation shop).

Secondly, knowing market trend is also one of the advantages of Big Data. At the moment, the market and technology have changed quickly under a highly competitive condition because people are interested to have their own business. There are many SMEs at present such as Startup Company. It is the fact that the customers' needs have changed all the time. Big Data helps business to reach high growth rate and become profitability in terms of increasing of sales volume. In terms of businesses, if they know the trend of the market quick enough, they have opportunity to prepare themselves, to create marketing campaign or promotion properly to motivate customer to stay in our shop longer and to pay more. Big Data can support entrepreneurs to perform them including decision making accurately and support everyone in their company to follow the company goals efficiently. "The businesses who have ability to

response customers' needs fast, they have opportunity to achieve the competitiveness. Currently, if their businesses are laggard, it cannot survive in the market in the long run", interviewee no. 2 (Clothes shop).

Finally, SMEs can gain the advantages by managing the right amount of stock management. Data collection is related to the purchase history and consumption of customers' products such as the characteristics of customers, amount and quantity of products are sold for each of customer, etc., allowing operators to help answer the following questions: Which period and which products were sold most such that they can prepare enough product stock? Or which period and which products are bad selling to reduce purchasing process? "My products have the high cost and have the expired date. If I have not stocked inventories much, my business has loss both opportunity to sales and loyalty customers", interviewee no. 3 (Contact Lenses shop).

Big Data helps organizations to maintain sufficient product stock level to meet the customers' needs. Furthermore, it helps reduce the cost of unpopular product storage. It helps manage cash flow of company in an efficient manner.

**Part 2: Discussions of using Big Data for SMEs business entrepreneurs**

From the interviews, 25 participants can be grouped into 9 business industries as follows: Technology, Clothes, Beauty, Food, Car, Construction, Paper, Transportation, and Gold. In term of expectation that related to Big Data usage for SMEs entrepreneurs, their expectation can be summarized into 5 categories. The first category is to improve processes for exchanging and sharing information. The second category is to create a personalized experience for each customer. The third category is to change visitors to customers. The fourth category is to help develop and create new business opportunities. The last one is to set the effective price. In this research, the relationship between variables and the relationship with different industry on SME entrepreneurs' expectation would be analyzed.

For technology business, the interviewees consisted of earphone shop, board games and internet store, and Infrastructure and Consultant Company. As always, technology has changed very quickly but comes with high cost. Most of the time, people only come to look for products but not buying them. The most commonly reasons for customer rejection to buy are confusion, lack of knowledge, lack of confidence to spend

their money to buy things at that time. Many times, sellers need to provide more technical knowledge or any suggestion of products to convince customer purchasing. Moreover, their expectation of SMEs entrepreneurs that related to Big Data usage are to change visitors to customers and to set the price to be effective respectively. Big Data can provide the information which product is the most popular technology product in the market right now and why customers choose them. Then, the store can offer confidence to customer by providing a bit of advantage in trying it out, then customers purchased it. Big Data can provide entrepreneurs with information behind why customer come to their shops, then they buy or do not buy it such as technical knowledge, good services for suggestion, pricing, the speed of internet that consumers prefer to play a game, the popular game in the social. These information can improve services of shop to increase customer satisfaction and propose solution to increase customer experience and to solve customer problems. Because all technology shops offer similar products, the differentiation is the shop design and services that make customers more satisfied. Then, customers prefer to buy products at the shops which provided the best services and offered the best solution to them. This can help convert the visitor to customer at the end. In term of pricing, technology products usually have similar cost for the same products. Big Data help set the selling price to be competitive and to create proper promotion that urges customer to pay more with the additional little budget. If we have known the information from supplier how much they got this products from manufacturer, it helps them to negotiate with the suppliers well to get the lower prices and then they can set the reasonable price that motivate customers buying or set the promotion which generates sales volume such as lower price but big volume purchase. For another example, if customers pay internet for 185 baht, the result of data analytics may, in addition, offer customer to choose the internet plus drink only 200 baht, which can increase sales volume.

For clothes business, clothes shop and second hand shop belong to this business category. Regarding interviewing information, the priority of using Big Data in entrepreneurs' perspectives are to create a personalized experience, to change visitors to customers, and to set the effective price respectively. This cannot be achieved easily because not only their products are clothes, but also they have to provide their service to create customers such as promotion and recommendations. In general, clothes shops

like to sell not too much style of clothes such as sport, casual, working clothes because owners would like to create brand awareness into customer. For example, if customers would like to purchase sport clothes, customers will recognize their brands. Big Data helps online clothes of SMEs business to communicate or offers customized for individual clients by tracking customer behavior data and analyzing the data. Big Data provided entrepreneurs information who are customer target in term of clothes styles of their shop. Their products create their brand identity that created and bring the customer awareness highly. They believed that Big Data can handle the various customer requirements easily. Then, Big Data helps entrepreneurs make ads or communicate for the upcoming fashion to the right customers at the right time. It will transform the visitors into customers at the end. In other expectation of SMEs entrepreneurs, Big Data can support the price setting of clothes effectively. Most customers bought the clothes in order to make them more beautiful, looking good and boost their confidence. Even customers spend much money for above reasons, they are clever customers to compare the pricing before buying. Therefore, if entrepreneurs have information about market price in the details of clothes style, they can create competitive price strategy and set the product price to motivate customers to buy more. The suggested price should not deviate from reference price too much. And also, clothing business entrepreneurs can keep an eye on changes in market trend to foresee demand and supply in the market by analyzing how much customers are willing to pay for entrepreneurs. "Consumers would like seller to suggest the style or to recommend which clothes are suitable for each individual customer. Customers like to try it on and get any motivation from sellers who would like to up sales to increase their confidence", interviewee no. 2.

For beauty business, most of them are online business. These includes contact lenses and eye-glasses shop, flower shop, cosmetics shop, jewelry shop, skin care shop, and gift shop. At the moment, we cannot refuse that beauty business is a popular business in the market and has many new competitors continuously. The number of beauty industry is growing very rapidly. And also, the demand for all beauty products is increasing from many sections of population at the same time. In terms of SME entrepreneur expectation of using Big Data for beauty business, Big Data helps business owners to track the trend and fashion. They have to response to customers fast with the right time and right customer target group. The expectation that related to Big

Data usage is to create personalized experience for each customer, to improve processes for exchanging and sharing information, to set more effective price, to convert visitors to customers, and to develop and create new business opportunities. In terms of personalized experience for each customer, Big Data helps online SMEs to create customer experience or analyzing the data regarding the customer behavior. Entrepreneurs will perform the right interaction, the right way, and the right time to build the good relationships with customers that create customer profile and become profits for entrepreneurs at the end such as customer behavior data for purchasing and searching for products to create personalized experience for each customer. Entrepreneurs can present products and create promotions that match each customer's preferences on the online store page and their characteristics. Big Data may help communicate to the potential customers at the right channel where they often use and do not disturb them with the ads of products in which they are not interested. In terms of to improve processes for exchanging and sharing information. The researcher found that the information was the important thing. Entrepreneurs would like to improve the way of processes in order to enable the exchange of information and the sharing of information between agencies more efficiently without losing the information such as between customers to their companies, suppliers to their companies, and belong to one's own department. They expected the system to collect all data from customer behaviors and supplier behaviors and can use it to analyze as their requirements later. Because the exchange of information and sharing of information will be the key to reduce the risk of receiving incorrect orders that related to level of customer satisfaction even though it causes from their companies or suppliers. In following expectation, SMEs entrepreneurs concerned about the product pricing which have the high competition in this market. They would like Big Data to provide information of the range of this product price or any campaign from the competitors, then they can launch the campaign properly to persuade customers to buy in their shop with the maximum sales. As above reasons, they thought Big Data can change buyers or visitors to be their customers at the end because the cheapest price of product can persuade customers to buy with the shop that they might have not known before. And the last one, information will be the key of the introduction of new knowledge and that can drive to the new business opportunity in the future. Big Data helps beauty online retailers understand customers' insights such

as observation of customer needs as well as creating new business opportunities from data in procuring products. For example, some customers are starting to buy diapers or vitamin for mother more often. The information indicates that customers may just have babies. Entrepreneurs can also create new business opportunities by offering other baby products to customers and as time goes on, products may be offered such as nutritional supplements as the child grows. "In my perspective, to retaining existing customers is cheaper than to finding new customers and I expect Big Data can help it with the right channel and right time.", interviewee no. 10.

For restaurant business, restaurant business consisted of Royal Project Foundation shop, egg factory, bakery shop. Restaurant or Café shops always purchase the ingredient products to produce their food in every day. At the end of day, it creates a lot of food waste that become the major loss in their restaurants business. Some products can be sold very well, while as some products are not sold frequently. The best way to solve this problem is that restaurants need to understand customer' needs. The first SME entrepreneurs' expectation of using Big Data for restaurant business are to create a personalized experience for each customer. In fact, people have different tastes and the restaurants cannot serve the food to make everyone like it. Big Data should collect individual taste or favorite food for each customer to create personalization experiences. When restaurants have special menus, the messages of this menu should be sent to the right customer as customers' personalization. In terms of change visitors to customers, Big Data support them to find the standard taste or products most people like it, then restaurant produce it. The visitors who are come in coincidentally might change to be loyalty customer in the future. And also, it helps develop and create new business opportunity in other business areas when they have more information about their restaurant. For example from entrepreneur no. 7, Big Data provides intelligent information that use the security camera in each shop to analyze the customer behavior for better shop design. The owners of coffee shops can analyze which areas customer would like to sit and why to improve their services such as temperature, design. Then, new business opportunity may be to convert café shop into co-working space.

For car business industry, they consisted of the repair and maintenance of motorcycle, and the decoration of luxury Car Company. As interviewed, entrepreneurs always invest the high cost in spare parts and accessories stock that are the main

products of this business in repairing and in decorating vehicles. However, these services are not regularly provided. It will happen only when the motorcycle has problems to repair or customers wish to decorate their cars. Therefore, the first priority of SME entrepreneur expectation of using Big Data for car business is to create a personalized experience for each customer. Big Data helps SME entrepreneurs to create customer experience regarding their individual customer profiles such as purchasing history, individual services. For example, the information can be used to notify customers about maintenance and inspection their cars when scheduled time meets. This will increase and create the good personalized experiences to customers. Moreover, stores should prepare the stock of spare parts to meet customers' requirements. If customers come and companies do not have spare parts providing them, they will lose the opportunity to sales it. This relates to their performances and reduces customer satisfaction. In term of exchanging and sharing information, entrepreneurs realized that cost of spare parts stock was too high. It became a huge investment. They expected that Big Data helps them forecast and plan stock to appropriate level where the demand and supply are met by using information from the previous years and previous months. For example, expected benefits of Big Data include:

1. Forecasting the periods when customers will come to decorate as their spending habits,

2. Alerting when spare parts are lower than minimum stock level and required to purchase it immediately, or

3. Preparing available stock for unexpected event. For example, during Songkran festival, people may face accidents and many suppliers may close their office.

The information between company and supplier is significant to be exchanged, reminded, and to confirm between receivers and senders and it relates to customer satisfaction especially the specification details of spare parts. Sometimes, they cannot find substituted spare parts. As the result, business performance will be not good and related to customer satisfaction. As mentioned above, Big Data can reduce some tasks of operation that normally people should monitor manually and improve processes from exchanging and sharing information both supplier and customer parties.

For construction business, their businesses are to provide the designed structure of house implementation to customers. They are new comers of this business

for 6 years. In terms of SME entrepreneur expectation of using Big Data for construction business, they expected that Big Data helps their businesses to meet the big sales volumes of customer at the first priority. That is to change visitors to be their customers. They have tried to understand the algorithm of google search application and have suffered to educate it manually, they have expected that google will propose visitors their websites when searching with any keyword or hashtag that identified into their construction business. Therefore, they expected that Big Data helps do this automatically with an easy way. Furthermore, the online retailers can use information about online visitor behaviors, but visitors have not made a purchase yet such as information from the pages, duration of a visit, products that click on the data and select to the online shopping cart but later canceled, etc., to analyze why visitors do not buy their products and the causes that make the purchase failed. They expected Big Data analysis helps online retailers to improve their online storefront, service and doing promotion in order to ultimately turn visitors into customers. After targeting the right customer, the second rank of their expectation to use Big Data is setting the price for each group of customers including visitors who spend in their pages longer but not making any purchase. Entrepreneurs expected to have information from Big Data on how much the competitions sell this product, then they will set the cheaper price that motivates customer to buy immediately. She said that "some products are accepted to sales without any profit because she tried to convince visitors/customers to buy with hers for the next time", interviewee 12. As the construction time of house building which usually requires long time of at least 6 months, they expected customers repurchase and they will gain more profit for the next time because they increased customer satisfaction with the cheapest price of their products in the last time. This is relevant to improve processes for exchanging and sharing information both internal and external sources. Because they have applied this sales strategy from other business industry into theirs companies. Besides, they expected that the data which they collected by themselves into Big Data source must create from a safe technology environment and not publish to other customers to bargain them again or other companies to use the same strategies. In addition, there would be the good thing if there are no hackers to steal their information because some customer's information are confidential especially financial information. It is typical to use the benefit of external data to analyze such as competitors, reviews

of potential customers in the future in order to anticipate the trend for the business to move ahead of the competitors to help create the competitive advantage. For example, the market trend of construction has changed. Customers complained about the structure of house construction which was too heavy. They like something soft and easier to construct, so business has to follow the trend.

For paper business, they have many customer's orders and sometime the production process have the problem of not launching the products on time. They expected that Big Data helps create a personalized experience for each customer and to understand customer behavior more. Entrepreneurs should interact with the right way and the right time to the right customer. In general characteristics of paper used for textbook publisher, paper is sold well before starting of the academic term and the orders are stopped during the summer time because most students are off the school. Therefore, they should not annoy their customers much because of less usage and demand. Furthermore, it should increase productivity of their businesses to launch their products at the right time. This will create a good relationship with customers and eventually create profits. Therefore, Big Data will help decide the price setting to be effective. It has the high competition in the market. First thing that they tried to do is to lower cost of production and produce less wastes. They expected Big Data helps set the selling price that generates high profit and create more opportunity to win in this situation when customers always compared the price with competitors. Besides, entrepreneurs expected that they could track the demand and supply in the market and set the price that was beyond the break-even point and was able to maximize sales and profits for entrepreneurs with big sales volume. "Sometimes, my business has the shortage problem, I had not known the reason behind. If Big Data help forecast as the demand and supply at that current situation to decision about production process later, it would be great. In terms of manufactures, this is a great opportunity to increase the selling price. The stock should be available to produce it a lot at that time as well. ", interviewee 24. Last thing of their aspects is to change visitors to customers. Big Data analysis helps to improve their products quality and find business opportunities in order to increase high profit. For example, they should stock the paper before the demand is over and/or manufacturers' product is going out of stock. Organizations or any publishers who have

never been customers may contact the company to purchase hence turning visitors into customers.

For transportation business, the main product of this business is to provide transportation service of food from one place to another. In terms of SME entrepreneur expectation of using Big Data for transportation business, Big Data helps improve processes of exchanging and sharing information, set the price to be effective, and develop and create new business opportunities sequentially. Regarding process improvement in exchanging and sharing information, the competitive condition to win in this market is about the price of transportation service. Their business tried to find the good business example from others that they could follow. They expected that Big Data helps share information from other transportation companies which are the big company and provide example of the internal processes such that their business can follow. It is beneficial to their businesses to create minimum transportation costs and, hence they have power to compete in the market in term of the transportation price. After achieving this, Big Data help provide information to support entrepreneurs to set price that can gain the high profit. They said if they got the high volume of customers in the nearby areas, they can got the maximum profit for transportation service. Because one transport line can support more than one customer. Therefore, the strategy and information of company are powerful tool to build the profitability of company at the end. Final expectation in terms of SME entrepreneurs' aspects of transportation are to develop and to create new business opportunities. At the moment, their businesses are still small, so they have limited resources such as truck in each size. They expected Big Data helps them to create or to expand new market line which have high challenge and high competition if they have more resources such as transportation of small products for 7-11 company where used the small trucks to transport more frequently in a day. If they have got 7-11 to be their customers, they will have more power in term of competitive in this market.

For gold business, they are pawn-shop and they do not worry about the price because the gold price is based on commodity price. However, they concerned about counterfeit products that customers bring in. They expected that Big Data helps improve processes for exchanging and sharing information between pawn-shops. The entrepreneurs find the information sharing with the easy channel and can protect this

risk in this situation with the high knowledge in company and can reduce the careless of employees operation are causes. The following expectation from SMEs entrepreneurs, they expected Big Data change visitors to be customers. The market competitive edge of this business comes from the services. The necessary skills of seller is negotiation skill and offering good services during customer visits such as drink and comfortable facility. They expected Big Data can provide the information about visitor behaviors such as when customer come, which style of gold they are interested to buy, etc., to analyze the considerations that make customer purchasing. It has ability to retain the good services that make customer more satisfied and improve something that makes customer unhappy.

The researcher would like to summarize that the SMEs entrepreneurs in each of business industries has different expectation that related to Big Data usage as you can see below. The priority of expectation to use Big Data entrepreneurs' perspectives are to create a personalized experience for each customer, to change visitors to customers, and to set the price to be effective respectively. Moreover, the popular expectation when using Big Data for SMEs is to change visitors to customers.

**Table 4.1 Summary of SME entrepreneurs' expectation, classified by an industry**

| Expectation that related to Big Data usage | Technology | Clothes | Beauty | Restaurant | Car | Construction | Paper | Transportation | Gold |
|---|---|---|---|---|---|---|---|---|---|
| 1. Improve processes for exchanging and sharing information | | | 2 | | 2 | 3 | | 1 | 1 |
| 2. Create a personalized experience for each customer. | | 1 | 1 | 1 | 1 | | 1 | | |

**Table 4.1 Summary of SME entrepreneurs' expectation, classified by an industry (cont.)**

| Expectation that related to Big Data usage | Tech nology | Clothes | Beauty | Restau rant | Car | Constru ction | Paper | Transpor tation | Gold |
|---|---|---|---|---|---|---|---|---|---|
| 3. Improve processes for exchanging and sharing information | | | 2 | | 2 | 3 | | 1 | 1 |
| 4. Create a personalized experience for each customer. | | 1 | 1 | 1 | 1 | | 1 | | |
| 5. Change visitors to customers | 1 | 2 | 4 | 2 | | 1 | 3 | | 2 |
| 6. Help develop and create new business opportunities | | | 5 | 3 | | | | 3 | |
| 7. Set the price to be effective | 2 | 3 | 3 | | | 2 | 2 | 2 | |

**Remark: 1 means highest priority and 5 means lowest priority**

**Part 3: Factors that related to Big Data usage for SME entrepreneurs**

Regarding the interviewees' expectation, most of them were interested in the benefits of using Big Data in their businesses. Technology helps businesses to make decision faster and has the capability to process with Big Data that is more complex. The researcher needs to find in-depth details about criteria that related to Big Data usage in their organizations. The results are summarized below.

**1) Budget**

The most important factor relating to entrepreneurs' decision-making to use Big Data in their business was budget. Budget or fund played very important to drive business growth especially in smallest business. In their thoughts, Big Data are powerful technology that company can gain a lot of benefits to analyze information and it has the capability to manage the complex data and to build simply structure to understand easily. In the other hand, to use Big Data is the one big investment which they need to ensure the profitability from this investment. They also have concern about their cash flow. So, they prefer to invest money with the thing that can be worth to their business and get more tangible results in the short terms. "For any investment, I need to compare benefit that business gain with the investment", interviewee no. 3,4,10,11,14.

In terms of fund or budget, the researcher found that the type of industry and business size in terms of the number of employees had relationship to Big Data usage for SME entrepreneurs. They had to estimate the budget of their company, compared with the business size and profit margin that can gain from this investment. In their thoughts, if they had only one branch as head office, they can work with data by themselves with the simple technology and small investment. Many entrepreneurs thought that Big Data is necessary for the organizations which have many branches and a lot of employees. Because it is difficult to collect and work with data centrally. And also, it is difficult to control every employee who records the data in the same format at the right time. These businesses that have many branches and have huge size are likely to invest in using the Big Data in their organization. However, they considers about readiness of another elements in organization as well such as technology, mindset of people.

**2) Data Source (availability)**

The information can answer various questions. In entrepreneurs' perspectives, it is important that everyone in an organization needs to have full understand of the existing data and know how to manage their data to make it ready to use. Data is the starting point of every process and many people used it to make decisions. In entrepreneurs' businesses, they have made the decision incorrectly because of incorrect data. Employees in the organization have not known the objective of collecting data, so they recorded as their understanding, and then it becomes the

unexpected results when entrepreneurs need to use it. In their thoughts, to prepare the data formats and to understand objectives when collecting data are the important practices that become the potential results of what owners want. For example, what are the kind of data that organizations require? What is the best seller products and what generates the highest revenues? These data can be analyzed about the performance of sales employees. After data is properly captured, the skill of entrepreneurs for making advance results are necessary skills to predict what will happen and to analyze other advanced dynamic results as entrepreneurs need in further.

At the point of data source, the researcher has found that the type of business model of entrepreneurs businesses had relationship to Big Data usage for SME entrepreneurs. Most of entrepreneurs who agreed to use Big Data are online business. In their thoughts, they have already got the readiness of information from e-commerce systems without any changes. They can perform as the regular task in every day. They have no extra actions to prepare or to record anything too much into system. It is very convenient to adopt technology into their businesses. They expected that Big Data helped them manage the data structures that they could get the results fast and accurately in the formats that was easy to understand and was clearly defined. If the organization changes its data collection to a centralized database, it will make that information more reliable and transparent. Organizations can solve in various issues from collection of relevant data which can see accurate result. It is important point which helps the organization to be ahead of the competitors as the data-driven organization. In the opposite site, the offline business thought Big Data helped make decision fast. However, there are many processes before they can start to analyze the data from Big Data such as input data into system, study how technology work, change their working behavior. They has less confidence to use Big Data than online business.

### 3) People (To perform data analysts, role, knowledge, skills)

Regarding the challenges arising from the power of using Big Data analysis, executives thought that workers or employees must have understanding in terms of business skills along with the professional technical skills. These skills will create the maximum benefits and achieve company's goals.

In term of SME entrepreneurs' perspectives, they concern about people in their organization. If they decided to use Big Data in their companies, companies need

employees with technical skill in terms of analytic capabilities; usage, visibility, and the effective action plan. In more details, the usage is the analysis results that are embedded in various tools such as a dashboard design and reporting. The visibility is the result creation what the standard report formats at the management level would like to use as business intelligence and predictive models. The action plan is the performance of using Big Data analysis systems to get the result fast, and to have ability and achieving a competitive advantage with the business. Regarding this skill of employees, to hire a specialist or build analysis teams in SMEs is difficult to make if their businesses are not related with any technology before. It might create the high operation cost at the same time. If there are no people who are keen to technology and with analytical skills, it is impossible to get the good results because people are the important thing that help turning data into useful information for decision making. If they do not know how to use, the existing technology is useless.

In terms of people, the researcher found that the type of industry had relationship to determination in Big Data usage for SME entrepreneurs. The technology related industries are familiar with any changes in technology such as IT Company, internet shop, and online business. They have already had the technical skill and just need to know how to use this Big Data only. While industries that are not related to any technology before like traditional businesses such as paper company, Construction Company, flower shops, people are nervous with a new technology. It might take a lot of time to educate people in these companies to study and have the knowledge about modern technology. "The mindset of people is the most difficult thing to change especially mindset of management level." interviewee 16.

### 4) Organization readiness (change management, time)

There are many challenges from competition in the market that forced company to use technology in order to response customer efficiently and have potential to compete in the market. However, there are 2 sub criteria traditional companies have no ability to change in terms of organization readiness.

First criteria is about change management. The organization which accepts changes must start by adjusting the mindset of everyone in the organization to participate as partner. This may not be an obstacle to these organizations because corporate culture is the foundation to success of the changes. The organization must be

part of the ecosystem in harmony. In terms of entrepreneurs' perspectives of using Big Data, team or department that wants to bring Big Data as part of the organization must have an inevitable management strategy for change management and resist Big Data as part of the organization. For example, some businesses might have stakeholders who are older and might be laggard of new technology. As they have the power to make decision on any investment of business, they will reject to use new technology. Therefore, it is necessary to change the mindset of people by starting from the person who have highest power such as authority, leader. They should accept that sometimes the technology still has flaws. As business has changed, it requires both information and experience to make a good decision.

Second criteria is about time. Many entrepreneurs said that they need more time. If they have ability to expand their businesses into many branches or have the high growth rate of business, they will use Big Data in their business. Some organizations at the moment are not be ready to invest any technology because of lack of financial resources and their data are still the simple data structure to easy in analysis.

In terms of organization readiness through change management, the researcher found that the length of establishment and sizing in terms of the number of employees have relationship to determination in Big Data usage for SME entrepreneurs. The companies that have long establishment usually have more conservative people in organization. In conservative people thoughts, the experience and connection in terms of business is the most important to bring business survival. They do not like changes and it is difficult to change their mindset that technology can help them to forecast and making decisions more accurately than traditional operation. In entrepreneurs' view, if Big Data can give the difference result between traditional operation and modern operation from technology such as how does it growth, they will accept to use it at the end.

In terms of organization readiness through time, the researcher found that the type of industry has relationship of determination in Big Data usage for SME entrepreneurs. Many entrepreneurs said they are not ready at the moment, they need more time to prepare. If they have more branches in the future that means their businesses can survive, they are interested to use Big Data. And also, the traditional

company needs more time than the new coming companies that have length of establishment of less than 10 years because they takes a lot of time to changes.

### 5) Technology (tools)

Currently, SME entrepreneurs still have 3 options to access Big Data in a low-cost fashion which is an online behavioral analysis tool for online store customers, Platform's Big Data system e-Marketplace and cloud computing.

Entrepreneurs said that Artificial Intelligence (AI) technology is an important tool for intelligent Big Data analysis. AI impacts and plays a role in 3 dimensions, mainly in the field of military, information and economic, so leaders and executives cannot avoid the need to bring the capabilities of Big Data Analytics to drive their companies.

They realized that business have readiness to use Big Data first can gain competitive in the market. Even technology has the high cost, it helps saving many cost in their organization if investor plan efficiently. For example, to bring technology instead of worker to analyze the trend in the market, to remind when stock is lower than minimum stock can solve the loss of business opportunity because of unavailable stock. Big Data helps forecast or plan in resource utilization. To rotate available employees into the appropriate branch that customers come a lot at that time is another benefit of AI. If this business has known the peak period of sales that have more customers, they can plan to hire the part-time resources to support more demand during that period. Big Data helps entrepreneurs make decision in the appropriate campaign that can gain the maximum profit because they can analyze which marketing campaign is waste for your money of company, then they can reduce these ineffective campaigns in order to reduce the cost of survey, and replace it with the advertisement of shooting message from modern technology that effective collecting data more accurately and quickly. If they use Big Data in their businesses, they have prepared and enhance the technology in their organization first to ensure that the devices will support technology to create high performance as their investment.

In terms of technology, the researcher found that the business model had relationship to determination of Big Data usage for SME entrepreneurs. If their businesses model are online, they thought it is suitable to use the technology as they always work with it. They requires a little bit of change and preparation. It has smaller

investment to purchase because they just adopt the existing resources to the new technology such as notebook, internet. The internet can go anywhere to find any information as you want. In the other hand, offline business might have no resources of technology ready. It is difficult thing to change if there is no one that has technical skills. In addition, technology will require some spaces at their storefront. So if technology is so big, it is difficult for it to manage the areas to process such as big servers. They prefer small size of technology or cloud computing to promise system such as USB, internet connection. In their perspectives, offline business model might have the things to set up more than online such as internet, network, notebooks, and printers. Therefore, technology aspect might be the significant thing with higher power to use Big Data for offline business than online business.

Overall, they think that technology can help as a decision-making tool and reduce any bias because of their mindset, emotion. They considered about the benefit of using Big Data. Some company hired outsources to develop system by themselves to create the result as they required. They should provide the high performance and more convenience to users. Some businesses develop their own system because they thought they have the same business, but it has different objectives to use the data. They expected that Big Data can apply technology in every aspect of entrepreneurs' requirements, it would be good. Outsourcing is unnecessary.

From the above information, it can be summarized as the factors and their characteristics that have relationship to Big Data usage for SMEs entrepreneurs as in Figure below.

**Table 4.2 Summary of factors and their characteristics that related to Big Data usage for SMEs entrepreneurs**

| Factors | Characteristics |
| --- | --- |
| 1. Money | • Industry<br>• Sizing (Number of Employees) |
| 2. Data Source | • Business Model |
| 3. People | • Industry |
| 4.1 Organization Readiness<br><br>(Change Management) | • Length of Establishment<br>• Sizing (Number of Employees) |
| 4.2 Organization Readiness (Time) | • Industry |
| 5. Technology | • Business Model |

# CHAPTER V
# CONCLUSIONS

In this section, the findings and collected information related to the advantages of Big Data from the previous chapters are summarized. The research was conducted to explore the expectation that has related to Big Data usage for SMEs, along with the relationships between the demographic characteristics and factors of technology acceptance. Subtopics in this chapter include 1) Summary, 2) Implications of Research, and 3) Recommendations for Further Studies.

## 5.1 Summary

The results in the previous chapter showed that most of SME entrepreneurs in Thailand understood the meaning of Big Data. They presented the interests in Big Data and believed that Big Data was the necessary technology for organizations. Implementing the technology and transforming their business into digital business helped their business in a long run. They tended to adopt this Big Data technology into their business both online and offline business. Despite being in the early stage of using data technology, SMEs' entrepreneurs in Thailand realized the benefits of collecting and analyzing basic information such as customer data and purchase history using simple and inexpensive technology. They knew that information could help answer several businesses pin points. In addition, they tried to find the extraction of the hidden information from the available data that may help them expand business or improve operation efficiency. They understood the need to explore information all around and spend more time, investment, and additional IT manpower to start adapting themselves to learn how Big Data works.

Entrepreneurs expected that Big Data would perform at the fully capacity to achieve the company's vision and goals. They expected it to solve many main issues of company such as increasing sales volume or generating new business opportunities. In

more advanced aspect, entrepreneurs would like to expand the scope of using Big Data to support decision making in the area of the product demand forecast, inventory management, and in-depth analysis of the customer behavior, promotion and campaign creation. The suitable promotion and effective campaign at the right place, right time, and right customers target group can improve product sales at the minimum cost if they did it correctly. All of these were able to manage sustainable business growth.

**Expectation of Big Data usage for SME entrepreneurs**

In the priority of expectation of using Big Data, SMEs entrepreneurs provide the different priorities of their expectation from various business areas.

The first rank of most SMEs entrepreneurs' expectation, Big Data has to create the personalized experience for each customer. The priority is to retain customer loyalty. One already aware that it is far cheaper to maintain existing customer to finding the new ones. They would like Big Data to help online SMEs communicating and creating unique experiences or offering customized solution for each individual client. Entrepreneurs can present products and create promotions that match each customer with the right interaction, the right way, and the right time. All of these help build good relationships with customers and make profits for entrepreneurs.

The second ranks of SMEs entrepreneurs' expectation is that they expect Big Data to help set the effective price. As everyone knows that product price is the most important consideration that relates customers' decision. Big Data can analyze customer behavior and set the effective price which can motivate them to buy more for each target group, especially for customers spending their time browsing for their interested products both online and off-line business. Entrepreneurs can keep an eye on changes of demand and supply in the market that has relation to increasing or reducing prices as customer can always search for the reference price in market. This enable companies to maximize sales and increase profits for entrepreneurs.

The third rank of SMEs entrepreneurs' expectation is to turn visitors into customers. Retailers can use information about visitor online behavior especially for the ones that have not made a purchase yet in order to analyze the reason stops them from buying the product and the considerations relating them to purchase. Then,

entrepreneurs can analyze and improve their sales and services by creating effective promotion to ultimately turn visitors into customers.

**Factors that related to Big Data usage for SME entrepreneurs**

   In aspects of factors relating to Big Data usage for their business, researcher found that there were several aspects related to demographic characteristics. First factor that entrepreneurs considered is money or available investment of business. Budget is the most important resource that can drive business growth. If companies have more money and entrepreneurs clearly see the ways that businesses can gain benefit from this investment, they would invest in this technology definitely. Second factor is data source availability, organization should assess the readiness to use Big Data by looking at what data they currently have. The underlying importance of this point is that quality data is the required input for meaningful business analysis. If the data is not available or not adequate, it is not likely that entrepreneurs can extract any benefits from the technology. Third factor is the people, especially their mindset that is difficult to change. Organizations need to change the mindset of people to be partner of new technology usage. Human is the main resource recording the data into the system before technology can process. If people can accept the technology, Big Data can make the information reducing personal bias and the followed by the consumer trend. Then, they will acceptingly increase their knowledges about analytics capabilities and efficiently work with Big Data.

   It can be said that the application of Big Data is not successful in SMEs in all cases, depending on the objective setting. It is important for SMEs to carefully utilize the available data and to have the ability to analyze it in order to increase their competitiveness. Big Data analysis is not the only tool that guarantees business success. Entrepreneurs must still look around and adjust themselves to industry trends. However, people who have Big Data in their hands will have an advantage over those who do not. The important thing is to choose the right information to use, the correct thinking process and appropriate analysis tools to get results that meet the objectives and goals set.

## 5.2 Implications of Research

The research is composed with the general contributions and the implications to the researcher. The result of this research shows a relationship between given Big Data Adoption for SMEs in literature review and the expectation to use Big Data for SMEs. It illustrates the comprehension of the expectation that related to Big Data usage of SMEs business entrepreneurs.

Based on the literature reviews, Coleman (Coleman, 2016) studied that huge organizations in all segments are making important progresses in relationship of consumers, products, and advancement by exploiting large information – Big Data. SMEs are proved to be slow adopter in using new technology of Big Data analytics and are in crisis of being left behind because they do not have the proper resources that are able to utilize Big Data such as people, tools, money, etc. In addition, Vajjhala (Vajjhala, 2016) researched that Big Data helps gain strategic competitive advantages for SMEs but they are often limited by the lack of adequate financial resources in order to invest on the technology and manpower. SMEs can take advantage of cloud computing techniques to avail the advantages of Big Data without significant investments in technology and manpower.

For SME entrepreneurs' views of using Big Data analytics, they realized that data analytics can be important for entrepreneurial practice. Operation should consider and put importance on data collection. If data is efficiently correct aligning with the business processes, it can also attend to significant improvement in their performance and quality of the decisions they make. In addition, entrepreneurs recognize the benefit of using Big Data finding the best solution from data collection complexity. Management perspectives tends to enhance the operation processes and structure the data collection to adopt this technology in organization. In the meanwhile, SMEs' entrepreneurs, especially offline business concern about investment usability and usefulness of Big Data because technology tools require the potential resources that must have ability to use. SMEs' entrepreneurs need to enable all of aspects along with using technology as soon as possible. It could also be identified as barrier of Thai workers to adopt technology, thus technology employing Big Data could enhance and think about after sales service and user-friendliness to eliminate negative impact towards

decision. Hence, entrepreneurs should be motivated by the best outcome and the better solution to reduce concern regarding to lack of effective manpower. In addition, another thing that entrepreneurs should be aware of about technology adoption is the customer data security and data collection regulations. The disclosure or leak of customer information could cause to serious impact on business. High securities can build confidence of customers purchasing products from their online store. Hence, all of these are implied between theories and managerial, they support SMEs entrepreneurs' expectation and more business sustainability can be created.

## 5.3 Limitations

Throughout the research, there are several limitations resulting in some gap of this study. First of all, the method of this research focuses on qualitative method gaining the general understanding of the key informants. It is unable to provide the reader the amount and value. Secondly, most of interviewees are entrepreneurs living in Bangkok areas, which does not represent the entire province in Thailand. Lastly, the interviewees possessing technical knowledge have not understood Big Data much despite the fact that it is all around them.

## 5.4 Recommendations of Further Studies

Regarding to academic contribution, researcher would like to suggest the further study on more specific techniques and technologies used to boost up business such as Online PR aspects, Mobile and Apps Marketing aspects, Online Video and Viral aspects, and ROI aspect etc. in order to use the information for the strategic planning of business with Big Data in the future.

In addition, it would be helpful to study the various applications of Big Data in some specific industries to gain a more insightful result. Moreover, the quantitative study could have been done in order to investigate the tangible benefits of Big Data helping minimize productivity cost or increasing sales. This can drive to strong evidence in utilizing Big Data towards business development as the SMEs entrepreneurs' expectation. This research; however, only studies and focuses on internal components,

thus, it is a challenge for future research to include external components such as government welfare. Finally, it is significant to investigate SMEs as whole picture, not only in Bangkok area, so you can see the big picture extending the Big Data Adoption readiness in SMEs business size.

# REFERENCES

Abdillah, L. A. (2017). The Role of Big Data and Cloud Computing for Technology Based Business. Advances in Intelligent Systems Research (AISR), volume 144. 183-187.

Ali, W. B., & Laparojkit, S. (2019). The Main Factors Influencing E-Business Technology Adoption of Entrepreneurs in WOW Project Songkhla, Thailand. *Journal of Management Sciences*, 60-86.

Ashraf. (2017). Organizational Development and Big Data: Factors that impact successful Big Data Implementations (dissertation). Benedictine University.

Baharuden, A. F., Isaac, O., & Ameen, A. (2019). Factors Influencing Big Data & Analytics (BD&A) Learning Intentions with Transformational Leadership as Moderator Variable: Malaysian SME Perspective. *International Journal of Management And Human Science, 3*(1), 10-20.

Bhat, W.A.& Quadri, S. M. K. (2015). Big Data promises value: Is hardware technology taken onboard? *Industrial Management & Data Systems*, 115(9), 1577-1595.

Bi, Z., & Cochran, D. (2014). Big Data analytics with applications. *Journal of Management Analytics*, *1*(4), 249-265.

Bumblauskas, D., Nold, H., Bumblauskas, P., & Igou, A. (2017). Big data analytics: transforming data to action. *Business Process Management Journal*, *23*(3), 703–720. doi: 10.1108/bpmj-03-2016-0056

Chisukorn Pornpanuwit. (1997). *Expectations of people towards the role of management Local Natural Resources of Subdistrict Administrative Organization Members: A case study of Phrae province*. Nakhonpathom: Mahidol University.

Coleman, S., Göb, R., Manco, G., Pievatolo, A., Tort-Martorell, X., & Reis, M. S. (2016). How can SMEs benefit from Big Data? Challenges and a path forward. *Quality and Reliability Engineering International*, *32*(6), 2151-2164.

Creswell JW, & VL, Plano Clark. (2011). *Designing and conducting mixed methods research*. Sage Publications, Los Angeles.

DANIEL LIBERTO, (2019). Small and Mid-size Enterprise (SME). Retrieved from https://www.investopedia.com/terms/s/smallandmidsizeenterprises.asp

Iqbal, M., Kazmi, S. H. A., Manzoor, A., Soomrani, A. R., Butt, S. H., & Shaikh, K. A. (2018). A study of big data for business growth in SMEs: Opportunities & challenges. *2018 International Conference on Computing, Mathematics and Engineering Technologies (ICoMET)*. doi: 10.1109/icomet.2018.8346368

Frizzo-Barker, J., Chow-White, P.A., Mozafari, M. &Ha, D. (2016). An empirical study of the rise of big data in business scholarship. *International Journal of Information Management*. 36(3). 403-413.

Matthew, R., Kevin, A. J., & Brian, D. (2015). The use of big data analytics in the retail industries in South Africa. *African Journal of Business Management*, *9*(19), 688–703. doi: 10.5897/ajbm2015.7827

Muhammad Iqbal. 2018. A Study of Big Data for Business Growth in SMEs: Opportunities & Challenges, 4-5

Nowotarska, S. W., Nowotarski, K., Grant, I. R., Elliott, C. T., Friedman, M., & Situ, C. (2017). Mechanisms of antimicrobial action of cinnamon and oregano oils, cinnamaldehyde, carvacrol, 2, 5-dihydroxybenzaldehyde, and 2-hydroxy-5-methoxybenzaldehyde against Mycobacterium avium subsp. paratuberculosis (Map). *Foods*, *6*(9), 72.

Nugroho, M. A., Susilo, A. Z., Fajar, M. A., & Rahmawati, D. (2017). Exploratory Study of SMEs Technology Adoption Readiness Factors. *Procedia Computer Science*, *124*, 329–336. doi: 10.1016/j.procs.2017.12.162

O'Connor, C., & Kelly, S. (2017). Facilitating knowledge management through  filtered Big Data: SME competitiveness in an agri-food sector. *Journal of Knowledge Management, 12*(38), 12-28.

Ogbuokiri, B.O.(MSc.). 2015. Implementing bigdata analytics for small and medium enterprise (SME) regional growth. *IOSR Journal of Computer Engineering*, 37-38

Riley, M. F. (n.d.). Big Data, HIPAA, and the Common Rule. *Big Data, Health Law, and Bioethics*, 251–264. doi: 10.1017/9781108147972.023

Robinson, E. A. (2012). *Exploring the barriers to online-business profitability for small businesses* (dissertation).

Shah, N., Irani, Z., & Sharif, A. M. (2017). Big Data in an HR context: Exploring organizational change readiness, employee attitudes and behaviors. *Journal of Business Research, 70*, 366-378.

Sukhothai Thammathirat Open University. (2003). *Theory and practice in educational administration, unit 9-12,4th edition*. Bangkok: Sukhothai Thammathirat Open University.

The Oxford Advanced Leaner's Dictionary. (2000). *Expectations of people meaning*. Oxford University Press.

Vajjhala, N. R., & Ramollari, E. (2016). Big Data using cloud computing-opportunities for small and medium-sized enterprises. *European Journal of Economics and Business Studies*, *2*(1), 129-137.

Wahid, F. and N. Indarti, Rendah, Adopsi Teknologi Informasi oleh UKM di Indonesia, in Pusat Informasi Perkoperasian. 2007, Dewan Koperasi Indonesia: Indonesia.

Wanamina Bostan Ali and Sumana Laparojkit. (2019). The Main Factors Influencing E-Business Technology Adoption of Entrepreneurs in WOW Project Songkhla, Thailand. *Journal of Management Sciences Vol.36 No.2*.

Wang, S., Li, J., & Zhao, D. (2017). Understanding the intention to use medical Big Data processing technique from the perspective of medical data analyst. *Information Discovery and Delivery*. *5*(9), 29-37.