

# Governmental Management of Big Data to Allocate COVID-19 Vaccines (Post COVID-19) to Make Public Policy in Thailand

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## ABSTRACT

The study “Governmental Management of Big Data to Allocate COVID-19 vaccines (Post COVID-19) to Make Public Policy in Thailand” aims to reflect the important and interesting issue of allocation of vaccines post COVID-19 to Make Public Policy in Thailand. It presents the importance of Big Data, demanding data from the COVID-19 vaccines, management of COVID-19 vaccines, and the Public Policy process related to the allocation of the COVID-19 vaccines and suggestions.

**Keywords:** Management; Governmental Big Data; Policy-Making Process; COVID-19 Vaccines.

## 1. INTRODUCTION

It can be considered that technology has played a role and influence on daily life, inevitably creating organizations or agencies in both the public and private sectors. Both large and small actors are trying to modify their business plans and corporate management strategies to stay prevalent in the rapidly changing world, by bringing technology to help support various operations to create a competitive advantage in business for the private sector or support policy-making supervisory work for government agencies. Especially, in an era of enormous data growth. Moreover, the data has a variety of formats and it is also fast and ever-changing information and is included as a feature called Big Data. At present, a large amount of information is emerging ready to be harvested as data. There are various activities all the time along with having a large number of equipment and also has a high growth rate as well. Therefore, the work of creating or producing and disseminating information is important because the creation of quality information leads to the use of credible

information and dissemination, especially to those who are responsible for making the policy. It will help guide the country in the right direction of governance. As well as causing sustainable development, use of information and reliable statistical principles along with the cooperation of government agencies, regulators and relevant officials are indispensable [1].

Therefore, leaders and executives of both the public and private sectors must be involved in the role of policymakers in national strategy. It must be open to accept and deeply study the transitions of the world that are entering new landscapes. Big Data Analytics is about to make a significant national strategic change like never before. This is imperative, to make the national strategy formulation in all dimensions in line with the changes of the world [2].

Currently, the COVID-19 outbreak is critically out of control. The government and related agencies will allocate the COVID-19 vaccine to cover all areas, in order to prevent the spread from reducing social inequality and to recover from the most

depressing economy to a sense of normalcy as soon as possible. Post COVID-19, should the government make preparations or is there any way to manage the big data of the allocation of the COVID-19 vaccines in Thailand to develop public policy?

## 2. BODY

### 2.1. Meaning

Big Data means huge amounts of data. It has both structured and unstructured data models which are mixed in a lot of business on a daily basis but not the amount of information that is important as important as the organization handles data, Big Data analytics lead to insights for better decision-making and business strategy.

### 2.2. Components of Big Data System

1. **Data Source:** the source of information. It could be a system, a program, or a human being that creates the data resulting in big data. Information often comes from a variety of sources, causing difficulties in managing the structure or provide coherent information that has been put together;
2. **Gateway:** this is a very important part and a big problem in making a big data project. It requires the skills of a data engineer both to write the program itself and use a wide variety of tools in this regard. To design the perfect linking channel, you need to know first what information will be used and what to do next.
3. **Storage:** this repository is not just about collecting data from a data source. Rather, it is a collection of information from multiple sources that is not yet used, which may be accommodation information available or it can be a repository of historical data.
4. **Analytics:** this is the main function of a data scientist, which is divided into two types: preliminary analysis by using statistical methods, or, an in-depth analysis by creating different models and using machine learning to get specific results and drill into each problem and each data set.
5. **Result/Action:** the results obtained from the analysis can be used in two ways: report them in order for the data analyst to

apply the results to business operations or implementat without the need for "human" monitoring, which requires more programming using Artificial Intelligence (AI) [3]

### 2.3. Key Characteristics of Big Data

High-quality big data should have six basic characteristics (6 Vs):

1. **Volume:** means the amount of information should be large enough. Thus, when analyzed, it will offer realistic insights such as the fact that we have information on the age and gender of most clients, allowing us to find the correct general demographic profile of the customer. If we have only a small portion of customer information, the estimated values may not be accurate.
2. **Variety:** means the format of the data should be different. It is to have structured, semi-structured, and unstructured, allowing us to analyze and complement each other until we have complete insights.
3. **Velocity:** refers to the characteristics of information that are generated in a fast, continuous and timely manner. Allows us to analyze real-time data, bring results to make decisions and respond promptly, such as GPS data used to track the location of the vehicle may be used to analyze the chances that cause an accident and design an accident prevention system.
4. **Veracity:** The reliability of the data source and the validity of the data set. There is a process to verify and verify the accuracy of information which is directly related to the results of the data analysis.
5. **Value:** means useful and relevant information in business. It must be understood first that not all data is useful for collection and analysis. Useful information must be relevant for business purposes, for example: if we want to increase the competitiveness in the market of the products sold, the most useful information is probably the competitor's product information.
6. **Variability:** means the data can change patterns according to usage or can be thought of analytically, from many aspects, and the format of data storage may differ from one source to another.

#### **2.4. How important is big data for the public sector?**

1. Promote participation from all sectors (Openness & Accountability)
2. Improve efficiency and transparency of government work (Efficiency & Transparency)
3. Support a proactive work policy towards results. (Result-Oriented Proactivity)
4. Respond to the needs of the people (Citizen Centricity).
5. Promote the service of the people (Service Excellence) [4]

#### **2.5. Separates a Big Data Of Government have 2 parts consist of:**

##### *2.5.1 Before COVID-19*

At present, big data is widely applied to help support the operations of many economic sectors such as public health helping to support the diagnosis of healthcare workers including predicting the disease of the patient from the examination results this makes it possible to plan treatment faster.

##### 2.5.1.1 Data analysis and Big Data

application trends can be summarized in 4 ways as follows:

1. **Forecasts based on current information (Nowcasting):** From the old method, we use historical data to predict the future (Forecasting), but the analysis of Big Data will change to use the current data or fast data instead; this makes it possible to predict faster.
2. **Prediction based on search behavior (Search Behavior):** Using information from the internet search terms for each period of time to analyze that reflect the real behavior of consumers to gain a competitive advantage and increase planning efficiency.
3. **Forecasts from Information Insights (Information Insights):** The use of big data analysis technology to find relationships and associations of information can give insights into each sector of the economy.
4. **Fraud Detection/Prevention (Fraud Detection/Prevention):** This is an extension of the results obtained from the insights relationships by observing the

behavior data travel, it can be checked for any malfunctions that occur and find ways to prevent it in time.

##### 2.5.1.2 Government Big Data Policy

The General Government of Prayut Chan-o-cha has supported and promoted the objective to push the public sector to focus on "stability, wealth and sustainability", according to the vision of Thailand in 2015-2020. This is one of the main strategies of the digital economy and society. To transform the government into a digital government, there is an integration between the departments. There is a smart operation- serve with people at the center and drive real change.

As well as the Digital Government Development Agency (Public Organization), abbreviated as "Sor Por." or Digital Government Development Agency (Public Organization) "DGA". It is a Thai public organization under the supervision of the Ministry of Information and Communication Technology, which has announced a plan to make "Big Data" by starting Big Data as a service for government agencies to use and under this policy, the Thai government will have the same set of information standards for serving people.

##### 2.5.1.3 Situation of the Coronavirus Outbreak in Thailand (2020 - 2021)

Thailand had confirmed cases of coronavirus infection, first identified on January 13, 2020. The Ministry of Public Health issued an announcement on March 1, 2020 that coronavirus disease or COVID-19 is a dangerous contagious disease under the Communicable Diseases Act 2015. The Prime Minister announced the state of emergency in all areas of Thailand on March 20, 2020 in accordance with the emergency decree on public administration in emergency situations, B.E. By enforcing the state of emergency from the date of announcement until April 30, 2020, it was necessary to extend the period of one month.

According to the situation report from the COVID-19 situation Control Center (CCSA), Department of Disease Control, Ministry of Public Health, on January 3, 2021, Thailand had 7,694 confirmed cases. There were 64 deaths and 3,293 hospitalized patients. In addition, important information about COVID-19 has been constantly released and updated to the public [5].

### 2.5.1.4 Vaccines Management

In the past, there were two brands of COVID-19 vaccines distributed in Thailand, with a total of 6,117,000 doses.

- Sinovac's CoronaVac vaccine, imported by the Government Pharmaceutical Organization (A.D.) totaling 6 million doses, arrived in Thailand in 8 lots between 24 February to 20 May.
- AstraZeneca Vaccine Imported by company AstraZeneca (Thailand) Co., Ltd. shipped from South Korea to Thailand, the first lot and another lot arrived on February 24, 117,000 doses.

In the future, the vaccine that will be offered to Thai people this year, according to the announced vaccine management plan of the Ministry of Public Health, totals 64 million doses, divided into

- AstraZeneca vaccine made in Thailand by the company Siam Bioscience Co., Ltd. (SBS), 61 million doses, will gradually come out in 7 lots (June: 6 million doses, July: 10 million doses, August: 10 million doses, September: 10 million doses, October: 10 Million doses, November: 10 million doses and December: 5 million doses)
- Three million doses of Sinovac vaccine will arrive in Thailand in June [6]

**COVID-19 vaccine service plan according to the national agenda that the Ministry of Public Health reported to the FAC with Gen. Prayut Chaired the meeting, concluded that:**

- BMA set a goal of vaccination 80,000 people / day, divided into 126 hospitals, approximately 30,000 people / day, the rest is a vaccination field in cooperation with 25 chambers of commerce, the proactive service unit, the service unit of the rais and hospitals in the social security network and hospitals under the Ministry of Public Health.
- The provinces set a goal of vaccination for 779,868 persons / day, divided into 993 hospitals, 261 field hospitals and 221 injection fields.

### 2.5.1.5 Ministry of Public Health set the Target Groups in 9 Groups, Consisting of

1. Medical and public health personnel who have not received the vaccines.

2. COVID-controlled workers and have the opportunity to come into contact with patients.
3. People over 60 years old and people with chronic diseases.
4. Occupations at risk of infection Including those who have professions / activities that are necessary for the livelihood of the people, such as public utilities, food, drugs.
5. Representatives of athletes to compete abroad.
6. Students / students going to study abroad or go to work abroad.
7. Insured person in the social security system.
8. Foreigners / foreign workers.
9. The general public.

From the above, the challenge is: how do we use this massive amount of information, without causing information overload? What we need to prepare to meet this challenge is:

- (1) **Technology readiness:** we must manage data at the level of Big Data, including storage, processing, monitoring, verification, data transformation techniques and advanced data analysis (Analytic Excellence) with regard to accuracy according to data governance principles (Data Governance).
- (2) **Data readiness:** nowadays, information is a very valuable asset to an organization until the start of a data trading business. Especially, information that reflects consumer behavior to be used for business benefits. This issue requires legislation to establish a policy to support the disclosure of information (Open Data), information exchange and the use of information sharing (Data Sharing) clearly.
- (3) **Personnel readiness:** we need to train people in the fields of science, mathematics, statistics and understanding of data characteristics (Data Characteristic) in the four main areas, namely, skills in explaining, diagnosing, observing data abnormalities and can use the data to create predictive models leading to effective policy making. The personnel who perform this important role are "Data Scientist" [7]

### *2.5.2 Post COVID-19 are a Large Database of Basic Evidence (Evidence-Based)*

When you know the origin, the importance and challenges of Big Data Post (COVID-19). The government will have to manage by bringing a

large database of basic evidence. (Evidence-Based) such as a systems are easy to use and are the same set of standards by analyzing and applying basic information to the process of making public policy. Therefore we want to present such as a big data which are the basic evidence for the preparation of Public Policy Process consisting of:

### 1. **Public Policy Formation, there are two components:**

- 1.1 Problem Identification: it is the real starting point of the policy process. It is the process of deciding which problems are important enough to decide where to find a solution or how to fix the problem [8], [9].

This step will consist of the people involved in solving the problem as follows:

1. Mass Media: an important component of being a catalyst to Problem Identification. It is the real starting point of the public policy process as it is a group that has an influence in accessing information both formal and informal can bring stories that have problems and affect society to public quickly by going into the depth of adhering to the subject matter the media wants to present to expose to the broader society such as the allocation of the COVID-19 vaccine in Thailand.
  2. Interest Group: The Government by the Ministry of Public Health should group people receiving vaccines services and medical personnel, a group that operates in the business of producing and importing vaccines, a group that operates insurance business, a group that operates life insurance business and the group that operates the health insurance business, etc.
  3. Public Opinion: opinions of all sectors on health effects Post the COVID-19 vaccination in Thailand, such as government, private sector, citizens, medical personnel. Vaccine manufacturers group that operates insurance business, a group that operates life insurance business and health insurance civil society and relevant stakeholders, etc.
- 1.2 Agenda Setting: It is very important because it involves screening and making decisions of which problems will be addressed by the government, such as the determination of the criteria for the allocation of the COVID-19

vaccination in Thailand so that it is comprehensive and quickly done.

The people who are heavily involved in the Agenda Setting process include:

1. Elites: politician who has joined the government when there is an opportunity to have various positions in the government such as Prime Minister, Deputy Prime Minister etc. that have conflicts of interest with public policy formulation.
2. Mass Media: an important component of being a catalyst for problem identification. It is the real starting point of the public policy process as it is a group that has an influence in accessing information despite being formal and informal, and are able to make stories that have problems and affect society and the country.
3. Candidates for Elective Office: selected by a political party to represent a political party to compete in an election on behalf of members of the house of representatives who are close to the people and have influence in the area.

Ways to formulate issues can be divided into two main ways: Agenda Setting from the top down and agenda setting from the top down.

In addition, establishing issues through the mass media is still a highly popular practice today being both players and refers in political games [8], [9], the media can be considered to have a great influence on the impact (Media Effects) in 3 ways:

1. Set issues and set up issues for Policy Maker.
2. Influence Attitude and Value through Policy Issues.
3. Change the behavior of citizens and decision-makers [8], [9].

### 2. **Public Policy Formulation**

In the process of public policy formulation, there will be players involved such as government agencies, interest groups, and planning policy organizations. Policy-Planning Organizations, also known as "Think Tank Team" [8], [9].

### 3. **Public Policy Adoption**

Can also be called Policy Legitimation. It is a step that focuses on transforming the proposed policy into one that is ready to be implemented. or ready to be enforced [8]. At this stage, there will be

differences in the detailed format of each state and/or country in the world. However, similar characteristics of states and/or countries in the world are pressure forces from various stakeholders groups, such as political parties, political advocacy groups, and political parties, and the elite in policy advocacy can pass at this stage [8], [9].

#### 4. Public Policy Implementation

[8], [9] said that the implementation of public policy can be considered. This is to create political continuity through additional means. Policy makers do not retire after the draft policy is passed. But making the various actions more complete is the actual advocacy of such a policy is the best in a concrete way. The policy implementation is related to various activities. Designed by the Legislative Branch such as activities may involve

- Establishment of a new organization or government agency
- Determination of new responsibilities of the organization or government agency

Moreover, public policy implementation is an important part of demonstrating that well-designed policies are effective. Will they be able to produce concrete results or not, and to what extent, because even if the policy goals and how good the design is in terms of policy making? But if in the process of implementing the policy is not actually possible and or not accepted. Not politically acceptable or supported, the policy is almost non-existent.

However, the author considers to operate Governmental Management of Big Data to Allocate COVID-19 vaccines Post (COVID-19) to make Public Policy in Thailand to increase its credibility and acceptance should be applied by focusing on the principle of transparency. The law that clearly mentions the creation of transparency is the Government Information Act, B.E.199. Thailand has developed various mechanisms. However, Thailand has not yet reached the point where the government are able to open as intended by the key characteristics of the ten principles of transparency

- 1) Information must be in the public domain. which must be disclosed primarily and concealed as an exception
- 2) Citizens and non-citizens have access to information.
- 3) All government agencies must be obligated to disclose information.
- 4) Government agencies must facilitate

information disclosure to the public by minimizing the burden on the people

- 5) There must be more efficient integration of information disclosure technology.
- 6) Exemption information is clearly defined.
- 7) Information disclosed must be of quality.
- 8) There must be a central government agency to promote transparency.
- 9) The concept of transparency must be adopted in the highest law of the country.
- 10) There should be a Freedom of Information act to define guidelines, methods and agencies. that clearly promotes transparency [10].

### 3. CONCLUSION

In the topic of Governmental Management of Big Data to Allocate COVID-19 vaccines Post (COVID-19) to make Public Policy in Thailand, the author have a suggestion that we should prepare as follows:

1. Prepare (1) technology, (2) Information readiness and (3) Personnel readiness. so that the Thai government sector will have the same set of information standards for serving the people.
2. Develop an integrated government big data management system, such as formulating a policy to provide accurate and clear information to operators and people Including the issuance of operating criteria from a central location with clear principles but to decentralize decision-making powers to regional and local authorities [5]
3. Adopt good governance by focusing on the principle of transparency. Transparency is used in the government's big data management process to allocate the vaccines against COVID-19 in Thailand post (COVID-19) to develop public policies to be efficient.

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