

Open Data Development and Value-Added Government Information: Case Studies of Taiwan E-Government

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ABSTRACT

This ongoing research explores the progress of open government data (OGD) in Taiwan. The concept of “value-added” government information is investigated. Six dimensions of open data policy are observed and suggested to be the strategies that Taiwan government should consider to further enhance its current development of OGD. In addition, in the literature of reusing public sector information to create added values, several challenges are identified to have negative impact on the value chain formation. By employing the six dimensions of open data policy, the research argues that the movement of OGD can strengthen the value chain creation of reusing government information and data, and the challenges as discussed in the literature are expected to be alleviated.

Categories and Subject Descriptors

H.4.2 [Information Systems Applications]: Type of systems – e-government applications

General Terms

Management, Performance, Design

Keywords

Information sharing, open data, value-added, Taiwan

1. OPEN GOVERNMENT DATA (OGD)

Researchers have claimed that one of the core missions of open government is to provide diversified and convenient approaches for the public to access government information and data. Government possessed information and data can be shared with and utilized by government agencies and the public to generate

additional added values and create innovative uses [1].

1.1 International Trend of OGD

In recent years, OGD to the public, including private enterprises and nonprofit organizations, has become an important policy among the government administration around the world. The public, including enterprises, businesses, and individuals is encouraged to find, download, analyze, compare, and integrate the government open data with other information sources or ICTs to provide greater value to the public through crowdsourcing [2].

In 2009, U.S. government established a web site (data.gov) to serve as the portal and platform for U.S. federal agencies to publish data for the public to access [3]. In May 2012, U.S. government released its digital government strategy, and OGD was indicated as an important information-centric support to sustain its 21st century e-Government development [4]. In May 2013, U.S. government took one step further to issue an executive order requiring federal agencies make open and machine readable format the new default for government information and data [5].

In 2007, according to an independent review, “The Power of Information,” U.K. government was recommended to improve access to public sector information to create new opportunities [6]. In early 2010, U.K. government set up its open data portal (data.gov.uk), which contains datasets from both U.K. central and local government agencies [7]. In June 2012, U.K. government released its open data white paper as its open data policy guideline for agencies to follow [8]. Particularly, in the end of 2012, Open Data Institute was established as an incubator to promote the use of government open data in U.K.

In the past few years, open data has become an important movement among the government administrations around the world. There are already forty-six countries and international organizations having launched their open data web sites with access to machine-readable data [3].

1.2 The Development of OGD in Taiwan

Since the Freedom of Government Information Law, Administrative Procedure Act, and other related legislation are enacted and put into practice, Taiwan government has gradually institutionalized the regulation of freedom of government information and been able to join the rank of other major

democratic countries in this regard. In recent years, OGD in Taiwan has received significant attentions. Both central and local governments frequently and urgently hold meetings and conferences to discuss this topic with the general public including individuals, private enterprises, and nonprofit organizations.

In Taiwan, open data is not a brand-new concept. Some central government agencies have been continually providing their data to serve the public for years. The major difference is that the public has to apply for permission and to pay a certain fees in order to acquire data. In the current international movement of open data in most countries, use and re-use of government held information and data is expected to be free, and information and data should be able to be accessed from anywhere at any time without discrimination.

Among all the local governments, Taipei City government set its open data portal (data.taipei.gov.tw) online in November, 2011, which is the first government open data web site in Taiwan. Recently, in December, 2012, New Taipei City government also announced that its open data web site (data.ntpc.gov.tw) is online to provide services. Apparently, more and more government agencies in Taiwan have recognized the importance of OGD and the values and opportunities it can create to the whole society. Furthermore, developed by the public, several software applications and information systems have demonstrated the innovation and power of using government open data. For instance, in October, 2012, several software engineers used their spare time to develop a popular web site of real-estate transaction disclosure by using the data released from Department of Land Administration. This case provides an excellent example that government data can be utilized in an alternative and creative way to provide more conveniences to the public.

When the importance of OGD was gradually recognized, in November, 2012, the prime minister of Taiwan required responsible central government agencies to develop appropriate legislation and policy for the implementations of open data initiatives. In February, 2013, an initial open data policy was enacted by the Research, Development and Evaluation Commission (RDEC), Executive Yuan. At the meantime, under an executive order from Prime Minister, agencies of Taiwan are required to gradually open their possessed data to the public. Each central government agency is required to open at least fifty datasets in the end of 2013. Currently, several central and local government agencies already published their individual open data portals online. The open data portal of Taiwan (data.gov.tw) also made its debut in the end of April, 2013.

2. VALUE-ADDED GOVERNMENT INFORMATION

Before the trend of OGD prevails, researchers have been stating the importance of reusing government information and data as a kind of material and encouraging that their potential value should be further exploited to develop new product and service [9]. Other researchers also define value-added government information as the individual or organizational use of information and data provided by the public sector for commercial or non-commercial purposes [10]. The value chain of reusing government information and data is composed of the following stages, the production and collection stage, the storage stage, the distribution stage, the adoption and value-added stage, and lastly the stage of marketing and providing service to end users [9]. Both government agencies

and the public, including individuals, organization, and enterprises, are expected to participate in this value chain of reusing government information and data. However, the formation of this value chain encounters its challenges [11]:

- 1) Information asymmetry: The public does not have sufficient information regarding what information and data that government agencies possess, what can be applied for value-added purposes, and what copyright and license exist to regulate the usage of public sector information.
- 2) High transaction cost: The public usually has to interact with different government agencies to meet respective operational and statutory requirements in order to acquire the information and data for value-added purposes.
- 3) Gap of mutual understanding: A lack of an effective communication channel between government agencies and information requestors. Government agencies are non-profit organizations and may overlook the for-profit purposes of private enterprises, which also reduce the private sector's intention and motivation toward acquiring and reusing government information and data.
- 4) Immature operational model: When providing information and data to the private sector, government agencies have to stick with rigid or former regulations and can become inflexible regarding what information and data they can provide. The private sector tends to passively accept what it can get for value-added purposes.

3. RESEARCH DESIGN AND METHOD

This research investigates the current development of government open data in Taiwan. Specifically, two research questions are the main focus of this exploratory inquiry:

- 1) What strategies that Taiwan government should implement to achieve better efficiency and effectiveness on OGD?
- 2) While OGD is a new international trend, what impact may it have on the value chain of reusing government information and data?

A case study methodology was employed to conduct the research. The two selected cases were the Taipei City Open Data Platform and the e-Networking Services of Ministry of Transportation. Four step-by-step approaches, literature review and web site observation, focus group, secondary data analysis, and survey, were adopted for the purposes of data collection and analysis. During the literature review process, related literature in interagency information sharing and open data were reviewed. In addition, government open data web sites, including United States, Canada, United Kingdom, Australia, New Zealand, and Singapore, were observed to explore how other governments run their open data initiatives. Furthermore, government officials and information users of the two cases were respectively invited to participate in two focus groups. The discussions from both open data providers and users offer two different perspectives for researchers to explore the complexity of open data operations and to give researchers rich information to perceive how open data can benefit the value chain of reusing government information and data. A government is an important source of information that has potential significance for social science research. In the research,

in addition to collecting data from focus groups, related government documents and reports were also acquired through government web sites of the two selected cases. Lastly, online survey was administered to open data users of the two cases.

4. DISCUSSIONS

It is indicated that government possessed data and information can be shared with and utilized by the public to create value-added and innovative uses. Through the observation and analysis of open data sites and related policies of the aforementioned countries, six dimensions of open data policy are suggested to focus on during the initial development of OGD. The six dimensions are legislation and policy, variety of open data, technological standard and data format, single open data platform, promotions of open data, and appropriate licensing. In addition, based on the empirical data, the movement of OGD is observed to have direct influence on the public's value-added activities of reusing government data and information. The challenges of using government data and information for value-added purposes can be alleviated through the six dimensions of open data policy.

4.1 The Six Dimensions of Open Data Policy

It is not easy to evaluate or predict the outcomes and benefits that initiatives of government open data may bring in the short term while OGD should be considered a fundamental infrastructure in a democratic governance to make government more transparent. Overall, a well-established open data legislation and policy is the foundation for requiring and educating government agencies to open government data in this global open government movement. In the research, it was first observed that no single legislation and policy is designed specifically for all Taiwan government agencies to follow when they participate in open data initiatives. Rather, agencies have respective regulations and policies, and sometimes earlier established regulations in agencies can act as constraints to prohibit agencies from sharing data. The circumstance raised the difficulty to the public to acquire government data. According to the empirical data, the participants of focus groups and survey respondents all indicate that specific legislation and policy is critical for the implementation of OGD.

In the current findings, the majority of open data in the cases are more related to food, medical information, real estate, and transportation. However, while satisfied with the information systems utilized to distribute government open data, the users in the two cases suggest that the variety of open data should be further increased and the data quality can be improved. The Taiwan government already demands each central government agency to open at least fifty datasets in the end of 2013.

With the advancement of information technology, cloud computing should be placed as the fundamental facility to assist the distribution of government open data. According to the empirical data, the standardized open data technology and format among central and local government agencies having the same core businesses is critical for the public to efficiently acquire and process data in order to produce value-added applications. Similarly, enabled by cloud computing technologies, it was also indicated that a single portal of government open data is important to eliminate the information asymmetry between government agencies and the public by providing a window of better access and keep the public informed.

While a single portal can be convenient for the public to access government open data by saving time and cost. A portal can also act as a communication medium and platform to help agencies to identify open data needs of the public and to acquire feedbacks of the public after data utilization. The research participants also suggested that in order to educate the public to use government open data to create more innovative applications and values, the concept of utilizing government open data should be promoted by holding activities such as application contests and idea generations from the general public. Those activities can not only increase the utilization of open data, but also help to identify what potential datasets can be publicized.

Lastly, the majority of the focus group participants and the survey respondents possess the belief that government open data should be free to the public. While the Taiwan government maintains this fundamental belief, the government still reserves the right of fee charging in necessary situations. In addition, copyright of using open data is another concern. Therefore, clear and simple licensing without discrimination is critical for the public to grasp the understanding regarding how government open data can be legally and appropriately adopted and applied for value-added purposes.

4.2 Alleviate the Challenges of Value-Chain of Reusing Government Information and Data

It is observed that the movement of OGD can have direct influence on the formation of the value chain of reusing government information and data. Through OGD, the process for the public and private organizations to acquire government information and data can become easier and faster. The public and private organizations can transform from passively accepting whatever they might receive from government agencies to actively participating by offering suggestions regarding what datasets could be released in higher priority. Particularly, through the aforementioned six dimensions of open data policy, the challenges of using government data and information for value-added purposes can be reduced. The four aforementioned challenges of value chain are information asymmetry, high transaction cost, gap of mutual understanding, and immature operational model.

Information asymmetry is the challenge that the public and private organizations do not know what government data and information are available and permitted for value-added purpose. With related legislation and policy enacted, agencies are required to participate and open their possessed information and data to the public. By using single open data platform, the public can have a direct and simple access to retrieve the released government information and data. In addition, the variety of open data is the expectation that agencies should open as many datasets as possible to the public for rich access in terms of depth and width of data. In promotions of open data, a communication and feedback window can be established on an open data portal for the public to provide suggestions. Consequently, agencies can provide datasets that fit the needs of the public. Lastly, clear licensing of using public sector information allows the public to tell whether their usage of government information and data for value-added purposes is under statutory consent and does not violate copyright or related regulations. In sum, through legislation and policy, single open data platform, variety of open data, promotions of open data, and

appropriate licensing, the information asymmetry between government agencies and the public can be alleviated.

High transaction cost is the challenge that the public has to interact with several government agencies to acquire information or data. Agencies can have different regulations and processes for the public to apply for government information and data. With single and unified open data policy, the public can follow a single regulation and policy rather than spend time and resource on interacting with different agencies to figure out respective regulations and requirements. By using single open data portal, the interacting windows for the public to acquire government information and data can be simplified from many to one. Lastly, unified technological standard and data format can increase the efficiency of the public to access, analyze, and reuse government information and data rather than to spend time and effort on dealing with technical and data format issues. The public and private organizations can focus more on their core businesses of reusing government information and data to create values. In sum, through legislation and policy, single open data platform, and technological standard and data format, the transaction cost for the public to acquire government information and data can be decreased.

Gap of mutual understanding is the challenge that government agencies usually pay less attention to the public's reuse of government information and data for value-added purposes, or the released information and data do not meet the need of the public. Through legislation and policy enacted, government agencies are expected to actively participate and gradually release their possessed information and data. Agencies are required to value the need of the public. In addition, by promoting open data, open data portal can act as the interacting window for the public to provide feedbacks and suggestions regarding specific needs for agencies to consider and to improve the quality of released datasets.

Immature operational model is the challenge that government agencies usually stick with respective regulations and act inflexibly toward providing information and data to the public for value-added purposes. Therefore, the public usually takes a passive stance to accept whatever it can get from agencies. By using single legislation and policy to open government data, agencies can have a unified rule to engage in opening data rather than be restrained by individual regulations. The unified legislation and policy also help agencies find the balance between opening public sector information and copyright, privacy, and national security when OGD contradicts with agencies' respective regulations. Clear licensing also ensures that the public has the right of reusing government information and data and protects the public from infringing copyright. Lastly, promotions of open data allow the public to actively participate in initiations of OGD rather than be constrained by respective regulations of agencies and act passively. In sum, through legislation and policy, promotions of open data, and clear licensing, the operational model of reusing government information and data can be further developed and enhanced.

5. REMARKS

This preliminary research explores the current development of OGD in Taiwan. Through web site observations, focus groups, and survey, six dimensions of open data policy are suggested to

the Taiwan government when it engages in developing open data initiatives. It is also found that the six dimensions of open data policy can strengthen the value-chain creation of reusing government information and data by reducing encountered challenges. Overall, the discussions of this ongoing research are expected to provide insights to practitioners regarding the progress of policy implementation of OGD and contribute to the current OGD literature from an international perspective.

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