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# A Stakeholders Taxonomy for Opening Government Data Decision-Making

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**Abstract.** Stakeholders can have different views on the opening of data, and conflicts may arise between them. Several causes of disputes may arise during the decision-making process due to the diverse objectives, interests, and needs among the stakeholders that perceive their desires. Yet, no stakeholder taxonomy exists to guide this decision-making process. Direct and indirect stakeholders include open data providers, software developers, data scientists, privacy experts, decision-makers, users, open data evangelists, software developers, policy-makers and politicians. Using an iterative process, a stakeholders taxonomy was developed by classifying stakeholders based on their varying levels and views on openness. The taxonomy includes unaware, unknowledgeable, resistant, risk-averse, neutral, supportive, expert, champion, and leading roles. Each stakeholder proposes a unique mix of expertise, legitimacy, sense of urgency, perceived possible benefits, and risks. The stakeholder's taxonomy can help to improve the adoption of the decision-making process to open data.

**Keywords:** Stakeholder · Taxonomy · Open data · Open government data · Decision-making

## 1 Introduction

Varying stakeholders' interests in the decision-making process about whether to open or not disclose the data can be burdensome and challenging [1]. In government organisations, the challenges might be that stakeholders like decision-makers, civil servants, open data evangelists, software developers, and privacy analysis officers all have their different views and objectives [2, 3]. These stakeholders play diverse roles in the decision-making process of disclosing data ranging from setting goals, agendas, and ambitions to the actual opening of data [1]. Direct stakeholders are those who are involved in the decision-making process, but also indirect stakeholders might influence the ability to open datasets. For example, if indirect stakeholders like software developers adhere to transparency-by-design principles [4], then relevant datasets can be automatically opened or with less effort.

The different backgrounds of stakeholders in terms of their roles and interest, political views and institutional framework, economic constraints and pressures, risks-adverse cultures, and technical knowledge are all influencing factors in the decision-making process of opening data [5]. Therefore, the decision-making process becomes cumbersome, and the merits of opening data like creating transparency, accountability, and improve citizen engagement are not accomplished. Also, the stakeholders' heterogeneous roles and interests in opening government data might create inconsistent decision-making and initiate conflicts.

For example, data privacy analysis officers should be risk-averse and protective against opening the datasets. At the same time, decision-makers might have the authority whether to release or keep undisclosed datasets. In contrast, other open data stakeholders, such as politicians, administrative officers, and civil servants, might preferably release datasets without having insight into the possible far-reaching consequences of data sensitivity, misuse and misinterpretation of the data. They might only think and believe about the advantages of opening datasets to the public domain. The more dataset opened, the open data stakeholders will perceive the higher merits. Hence, these pros and cons of opening data to the public domain can create conflicts among the stakeholders and delayed the decision-making process.

The objective of this paper is to develop a taxonomy of Open Government Data (OGD) stakeholders. First, we review the stakeholder theory. Thereafter, we conduct a case study to identify the main stakeholders and mapping them using a power-interest matrix. Based on their varying levels and views on openness, the stakeholder's taxonomy was developed consisting of nine categories: unaware, unknowledgeable, resistant, risk-averse, neutral, supportive, expert, champion, and leading. The use of the taxonomy was illustrated by revisiting the case and mapping the stakeholders on the taxonomy. This classification can help understand the decision-making process better and balance the interests and conflicts among the stakeholders when disagreement in the decision-making process is found.

## 2 Theoretical Background

Stakeholder theory defines the specific stakeholders and then investigates these stakeholders' treatment by looking at their salience [6]. Managing stakeholders consists of identifying people and key actors, groups, or organisations that may positively and negatively impact the decision-making process [7]. The different types of stakeholders might be difficult to manage, yet their engagement can be managed by identifying their actual attention and needs [8]. Therefore, stakeholder analysis is often used to understand concerns among stakeholders, capture their roles and interests, and select the best decision-making that might impact their organisation's objectives and agendas [3, 9].

In the OGD domain, the backgrounds of different stakeholders in the decision-making process are often heterogeneous [10]. Opening of data is often advocated by politicians for ensuring transparency, accountability, participation and innovation [11]. Several key actors like decision-makers, executive boards, and policy-makers can veto decisions and set the policy on opening data's decision-making process. Whereas other types of stakeholders, such as civil servants and public managers can manage the progress

of the current state of the decision-making process, the best time to make a decision, and the possible outcome of the decisions made. Indirect stakeholders might set the conditions like software developers by ensuring software support for opening data, while others set the policy like privacy officers by determining rules of which data can be opened. Some stakeholders set the policy and weigh the estimated advantages and disadvantages of opening data, while others tend to focus on providing input and technical analysis to make decisions.

Classifying the stakeholders of OGD enables the decision-makers and policy-makers to manage stakeholder's interests and needs strategically [7, 8, 12, 13]. There are three main benefits of classifying stakeholder engagement to develop a management strategy in the decision-making process, as follows [3, 7, 8]: (1) Manage time to spend with each stakeholder. Decision-makers and policy-makers naturally manage decision-making process scope, timeline, possible investment, and other attributes while managing the stakeholders. The decision-makers should decide how much time to invest in each decision-making process to open data ranging from setting objectives, selecting the dataset, analysing the estimated advantage and disadvantage consequences, and time to decide whether to open or not to open the dataset. (2) Understand the most important roles and interests of each stakeholder. Classifying stakeholders by their level of positions for each role and interest may be very useful to the decision-makers. Every stakeholder in the OGD field indicates a unique mix of expertise, legitimacy, sense of urgency, perceived possible benefits, and potential risks-adverse. Therefore, classifying the stakeholders should define each stakeholder's essential roles, interests, and needs. (3) Determine the level of importance of each stakeholder's concern. In this situation, the decision-makers should prioritise stakeholders' level of importance based on the potential impacts on their concern on the decision-making process.

One of stakeholder management's key processes is defining and designing influential stakeholders' engagement agendas and plans [12]. The need to enhance stakeholder engagement is to help translate stakeholders' interests and needs into organisational goals and create an effective strategy in the decision-making process [1, 5]. Discovering the importance of consensus and intensive discussion among the OGD stakeholders should help stakeholders to reach a decision and ensure a time allocation and investment in a profitable outcome. There is a need for a stakeholder taxonomy to be able to understand the stakeholder positions and to improve the decision-making process of opening data.

### 3 Case Study Background

In this paper, we use electronic procurement (e-procurement) case study in Indonesia to capture stakeholders' context in the decision-making process to OGD. We employ a case study to the stakeholders, consisting of 25 participants derived from government institutions. The stakeholder included the member of the executive boards, politicians, decision-makers, policy-makers, civil servants, open data evangelists, and privacy analysis officers. Using the power-interest matrix of [12], the power and interests of the stakeholders in the decision-making process to open data were mapped, as shown in Fig. 1. The matrix shows that stakeholders have varying power and interest.

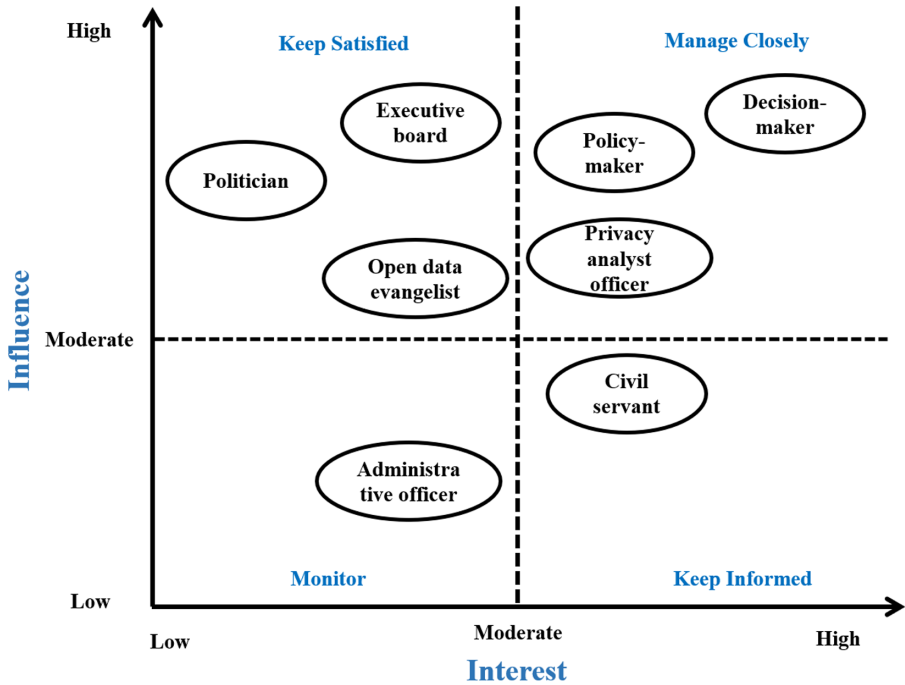


Fig. 1. The power-interest grid of stakeholders (based on the matrix from [12])

The decision-makers, policy-makers, and privacy analyst officers have a powerful influence and high interest in the decision-making process. The policy-makers established the policy-making objectives and agendas and translated the ideas into the policies. The decision-makers are responsible for setting decision alternatives and high interest to re-use the datasets to make better decisions. The decision-makers should adhere to the policies provided by the government institution. However, the procedures and policies are often ill-defined for a given dataset. Furthermore, policy-makers and decision-makers may have adequate knowledge and resources to create decision alternatives. Privacy analyst officers and open data evangelists are responsible for analysing and weighing the estimated risks and benefits of disclosing data; they all have high roles and interests in the decision-making process.

Thereafter, the politicians and executive boards have high roles and fewer interests in the decision-making process. The politicians, furthermore, can manage both contextual risks and the presence of open data legislation at the parliamentary level. Nevertheless, some politicians might not be interested in using the datasets for their personal advantages due to the cognitive constraint in analysing the datasets. At the same time, executive boards can contribute to the decision-making process to open data to support resources and policies. Yet, executive boards have limited time to re-use and analyse the datasets because they focus on the strategic programs and agendas. The civil servants have a moderate role and moderate interest level in the decision-making process. The civil servants can play a role in controlling the harmonisation among the stakeholders.

Simultaneously, the civil servants have enough attention to re-analyse the impact of published datasets. In addition, the administrative officers have a moderate role and lower interest level in the decision-making process administrative officers regularly maintain the OGD portal and provide valuable information to the public related to the dataset. The administrative officers also have soft attention to re-use and re-analyse the dataset to predict the consequence's opening datasets.

## 4 A Stakeholder Taxonomy

Our stakeholders' taxonomy was developed using an iterative process based on the stakeholder's overview, power, and interest (shown in Fig. 1). The stakeholders are classified based on their varying levels and views on openness. The stakeholder taxonomy consists of 9 roles. One stakeholder can have one or more roles.

- a) **Unaware (UW)**. These stakeholders are unaware of the decision-making process to open data & their potential impact can be taken lightly. In the OGD domain, it is possible that the decision-making process to open data in the low-level roles of stakeholders like administrative officers may be unaware of the decision-making consequences. Besides, they are not experienced in the benefits and estimated risks of opening data in the larger scale scheme. In our case study, the role of administrative officers is classified as an unaware stakeholder. Therefore, we suggested to this stakeholder can be classified as the supportive classification as the desired state.
- b) **Unknowledgeable (UK)**. Stakeholders having a lack of knowledge and expertise about the open data domain nor insight into decision-making methods are means for opening data. Our case study found that administrative officers are also facing some barriers to understanding the decision-making process and which approach should be taken in analysing the datasets. Therefore, we expect that this stakeholder can improve their cognitive and technical skills in the decision-making process.
- c) **Resistant (RS)**. These stakeholders are resistant to the decision-making process to open data & potential impact but resistant to change. Stakeholders classified at this engagement level can take jeopardise the decision-making process deliverables. Therefore, we should seriously take into account the need to be adopted the engagement level of such OGD stakeholders from the current state level to a more desired level. Hence, the government's top management level should devise an appropriate recognition system and reward for the potential stakeholders in this classification. In our case study, civil servants are classified as a resistant stakeholder. In the future, we expect that civil servants can improve their role as supportive stakeholder.
- d) **Risk-averse (RA)**. These stakeholders are unwilling to take risks as many as possible. The estimated risks of opening data can be derived from privacy violation, misuse, and misinterpretation of the dataset. In our case study, civil servants operated in a risk-averse culture and might embrace this attitude. This results in the decision to keep data closed by default to avoid the taking of any disadvantages.
- e) **Neutral (NT)**. The third classification is neutral to the decision-making process to open data. Stakeholders having this level of engagement are aware of the decision-making processes, yet neither supportive nor resistance can be taken lightly but

cannot be ignored. Stakeholders classifying under this level have been identified as having a high role and power of significant influence over the decision-making. Therefore, in this third level, a particular endeavour approach across the top-level management like politicians should be expanded to take such stakeholders to a more desired engagement level.

- f) **Supportive (SP).** The stakeholders falling under this classification are aware of the decision-making process to open data & potential impact and support the changes. Therefore, the stakeholder classifying in the supportive classification should be given high priority to continue to get the desired help by defining and providing agreement with other stakeholders. Our case study shows that executive boards, open data evangelists, and privacy analysis officers are potential supportive stakeholders. Still, we expect that these stakeholders classification can move to the leading cluster to help a better decision-making process of opening data. Simultaneously, we stimulate that several other stakeholders such as civil servants and administrative officers can also move their current states to the desired supportive classification.
- g) **Expert (EX).** These stakeholders have in-depth knowledge to analyse the opening data decision-making process, including the way to release and which factors adopt the decisions. In the current situation, our study found that open data evangelists and privacy analysis officers require to improve their knowledge and practical-based experience to reach the expert's stakeholders. Thus, these stakeholders are in substantial comprehension of the technical parts and have sufficient knowledge to adopt the prior decisions.
- h) **Champion (CH).** These types of stakeholders promote and stimulate the use of open data. They might not be involved in the actual opening data but advocate the benefits and provide support for opening data. Our study found that several strategic actors of the OGD stakeholders like politicians, policy-makers, and decision-makers are the most potential stakeholders to implement this champion's classification.
- i) **Leading (LD).** The stakeholders in this engagement level are aware of the decision-making process to open data and its potential consequences. The stakeholders also actively engaged in ensuring the success and the best decisions are made. Therefore, stakeholders with high power and influence on the decision-making should ideally reach this level of engagement. In this classification, policy-makers and decision-makers are counted as the leading stakeholder. Nevertheless, we expect these stakeholders to stay focused on the decision-making process's objectives and help other stakeholders open more a selected dataset.

## 5 Illustrating the Use of the Stakeholder Taxonomy

For our case study, the stakeholders are mapped based on the stakeholder's engagement levels. Based on grid position in Fig. 1 and the stakeholder's taxonomy, we derive classifications of stakeholders' current state and desire state, as presented in Table 1. The table shows that, for example, privacy analysis officers can be risk-averse (RA) to the datasets, but they also able to aware of the decision-making process to open data & potential impact and support the changes (SP). This shows that one actor can have multiple stakeholder roles. Combining some roles is not possible as these are conflicting, like neutral and champion.



**Table 1.** Mapping the stakeholder Using the Taxonomy

Stakeholder name	UW	UK	RS	RA	NT	SP	EX	CH	LD
Executive board	–	–	–	–	–	C	–	–	D
Politician	–	–	–	–	C	–	–	D	–
Open data evangelist	–	–	–	–	–	C	D	–	–
Policy-maker	–	–	–	–	–	–	–	D	C/D
Decision-maker	–	–	–	–	–	–	–	D	C/D
Privacy analysis officer	–	–	–	C	–	C	D	–	–
Civil servant	–	–	C	C	–	D	–	–	–
Administrative officer	C	C	–	–	–	D	–	–	–

\*C= Current state of the stakeholder classification

\*D= Desired state of the stakeholder classification

## 6 Conclusion

In the case study, we found different interests and several tensions among stakeholders, which result in a reluctance to open the dataset. Each stakeholder has different roles, concerns and interests in the decision-making process of disclosing the dataset. The merits of enhancing transparency, accountability, and citizen participation were in strong contrast to the difficulty of the opening data by the stakeholders in reality.

Therefore, we developed a taxonomy consisting of 9 roles based on their their varying levels and views on openness, e.g., unaware, unknowledgeable, resistant, risk-averse, neutral, supportive, expert, champion, and leading. One stakeholder can have one or more roles, although it is unlikely that some roles are combined like champion and resistant. With our stakeholder taxonomy, stakeholder’s roles and interests can be mapped to determine their positions and analyse the situation. Classifying the stakeholders can help government institutions and researchers better understand the importance of their roles and interests. This study contributes to providing a stakeholder engagement level to change the current state of the stakeholder’s position to the desired state in the future agendas. The classification of the stakeholders in this study should be generalised with care as only a single case was studied. We recommend using different case studies and empirical settings to discover a deeper understanding of stakeholders’ roles and interests in further research.

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