Analyzing Conflict Resolution between Online Transportation and Conventional Transportation Using Graph Model for Conflict Resolution (GMCR)

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Abstract—The purpose of this paper is to analyze the conflict between online transportation companies and conventional transportation in Indonesia. This conflict arose after the opening of several online transportation service companies (Uber, Grab and Go-Jek) in Indonesia. Parties involved in this conflict are drivers of online transportation services, owners and drivers of conventional transportations services and Indonesian government (Ministry of Transportation)

This research employs a qualitative research method and the data was collected using a literature review and interviews. This data was analyzed with the Graph Model for Conflict Resolution (GMCR) and validated through interviewed by the parties involved in this conflict.

There are two stages of conflict that analyzed in this research: frame I and frame II. The first is before the government issued the Ministry of Transportation regulation num. 108 of 2017, the second is after that. We found that there are 20 feasible scenarios for the frame I and 26 feasible scenarios for frame II.

Since there is a lot of business disruption in this internet era, this research can be used as a reference for Indonesian Government in resolving the similar conflict caused by the introduction of a new business model that threatens the stability of the conventional one.

Keywords—graph model, conflict, transportation

I. INTRODUCTION

The advancement of mobile technology such as smartphones, tablet computer, and wearable devices, has changed some of our daily activities, especially urban dwellers. One of the recent developments employing this technology is online transportation services. Online transportation services here refers to transportation services that connect community drivers – people who drive private cars instead of commercial vehicles - with passengers via mobile devices and applications, or in an academic term called ridesourcing [1]. Ridesourcing services have been expanding rapidly across the world, such as Uber and Lyft in the U.S., Didi Express in China, Ola in India, and even UberMOTO (for motor-cycle rides) in Thailand. Indonesia also had embraced these platforms and its market is dominated by Go-Jek, Grab and up to earlier this year, Uber [2].

The presence of online transportation service has created several oppositions worldwide, especially from conventional transportation services, such as taxis [3] [4], and public transit [5]. In Indonesia, such platform also faced with the same situation, where conventional transportation services (i.e. taxis, buses, and city transport) request the government to close the online transportation service companies and even use violence as a form of protest.

This research tried to analyze how the conflict evolved using GMCR to understand what kind of move that should be taken by the decision makers involved in this conflict. Data was collected from literature (e.g. media news) and interview with the decision makers. The goal of this paper is not to gives a recommendation for this conflict, but rather to analyze the movement of decision makers involved.

The rest of this paper is organized as follow: Section II discusses the background of the conflict—how the conflict arises and its development, and the literature related to this research. Section III analyses the conflict using GMCR: defining decision makers involved and options for each decision makers; determining feasible states and state (or scenario) preference for each decision makers. In this section, the analysis will be done per frame from the first frame to the second frame. The last section, section IV, offers a summary and future direction for this research.

A. Conflict Background

Conflicts between online transportation services and conventional transportation services started in 2016, where conventional transportation drivers staged a demonstration because they felt their

incomes dropped due to the presence of online transportation services. They demanded that the online transportation services be closed for its detrimental effect to them. The protests by conventional transport drivers occurred in several large cities such as Jakarta, Palembang, Malang, Balikpapan, Batam, Yogyakarta, Medan and almost all cities where online transportation services operate. Meanwhile, there are a lot of pressures to the government to make a regulation to legalize online transportation services existence. To calm down those strikes and cope with the pressure, the government then issued Minister of Transportation Regulation No. 32 of 2016. However, this regulation was considered discriminatory against conventional transportation services and created horizontal conflict between conventional transport drivers and online transport in the road.

Throughout the year 2017, this resistance to online transport was worsening, involving violence, extortion, and territorial bans. Along with their previous demand, conventional transportation drivers also asked the government to revoke Minister of Transportation Regulation No. 32 of 2016. To deal with the intimidation, violence and territorial bans, online transportation drivers started to remove their company attributes (i.e. jacket and helmet) when taking their passenger.

October 24th, 2017, the government then issued Minister of Transportation Regulation No. 108 of 2017, which should be effective from November 1st, 2017. In response to this regulation, online transportation services started conducting protest and demonstration, because this regulation has several clauses that unfavorable for them (e.g. incorporated vehicle registration certificate). They requested the government to revoke this regulation and made a new regulation that accommodating their needs. Along with that request, online transportation drivers also demanded the government to take serious action over acts of violence and intimidation by the taxis and city transport drivers.

After a series of protests and demonstrations, on March 28th, 2018, Aliando (National Alliance of Online Drivers) stated that Minister of Transportation Regulation No. 108 of 2017 was nullified by the government. While, this statement calmed down online transport drivers, from an interview with the Minister of Transportation's public relation officer, this regulation was actually never revoked. It still effective until today. However, since there is still no real action from the government for not abiding by this regulation, most online transport drivers still didn't comply with it.

II. METHOD

A. Graph Model for Conflict Resolution (GMCR)

The Graph Model for Conflict Resolution is derived from Conflict Analysis, as an improvement. In GMCR, graphs become the key component which defined as a Decision Maker's available moves. The directed graph in GMCR encoded one step of a Decision Maker's move.

The Graph Model for Conflict Resolution is a methodology to model and analyze strategic conflict. Its aim to make the process become simple, flexible, and involve minimal information while producing a good understanding of how decision makers should move and encourage them to be creative [4]

As Describe in [4], GMCR has four components, as follows:

- N is the set of decision-makers, where $2 \leq n = |N| < \infty$. It written as $N = \{1, 2, ..., n\}$.
- S is the set of (distinguishable) states, where $2 \leq m = |S| < \infty$. One particular state, s_0, is designated as the status quo state.
- For each $i \in N$, G_i is the Decision Maker's directed graph, where $G_i = (S, A_i)$. A_i is the arc set, where $A_i \subseteq S \times S$. The arcs, A_i, are the state transitions controlled by DM_i.
- For each $i \in N$, a complete binary relation $\succcurlyeq_i$ on S that specifies DM_i's preference over S. If $s, t \in S$, then $s \succcurlyeq_i t$ means that DM_i prefers s to t, or is indifferent between s and t. Following well-established conventions, we say that i strictly prefers s to t, written $s \succ_i t$, if and only if $s \succcurlyeq_i t$ but $\neg[t \succcurlyeq_i s]$ (i.e. it is not the case that $t \succcurlyeq_i s$). Also, we say that i is indifferent between s and t, written $s \sim_i t$, if and only if $s \succcurlyeq_i t$ and $t \succcurlyeq_i s$.

III. RESULT AND DISCUSSION

Based on how the conflict developed, there are three frames that we will model in this research. The first frame is before the government issued Minister of Transportation Regulation No. 108 of 2017. From this regulation was issued until Aliando stated that it was revoked as the second frame and the last frame is the period after that.

A. Decision Makers (DMs)

In this conflict, there are three decision makers involved: online transportation services, conventional transportation services, and the government (See Fig 1). Online transportation services are defined as the drivers of online transportation companies (e.g. Go-Jek, Grab), while conventional transportation services are drivers of the city, transports, buses, and taxis (which are under an organization named Organda). The government here is represented by the ministry of transportation. These decision makers are involved in all three frames analyzed in this research.
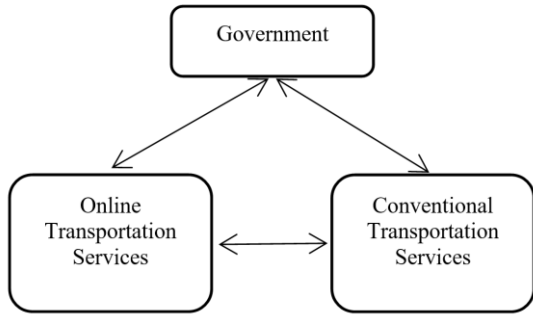
Fig 1 Decision Makers

The next steps of GMCR in this paper will be discussed per frame. Therefore, the frame I will be modeled and discussed first, followed by frame II and frame III.

B. Frame I

Based on the secondary and primary data obtained, options for each decision maker in the frame I can be found in Table 1. From these five options available, scenarios were developed, and scenarios that impossible to happen is removed. Those impossible occurrences are scenarios where conventional transport drivers conduct intimidation and violence against online transport and/or held mass demonstrations and strikes when online transportation services stop operating. Therefore, there are twenty feasible states/scenarios that then processed for the next steps (see Table 2). Status quo in this frame is scenario 3, where conventional transportation services conduct intimidation and violence against online transports, held mass demonstrations and strikes; conventional transportation services are in operation, and government have made a regulation to legalize online transportation services and did not revoke regulation No. 32 of 2016.

TABLE 1 OPTIONS FOR EACH DMS IN FRAME I

Code	Option
Conventional Transportation Services	
K1	Conduct intimidation and violence against online transport
K2	Held mass demonstrations and strikes
Online Transportation Services	
O1	Operating
Government	
P1	Revoke regulations Num. 32 of 2016
P2	Make regulation to legalize online transportation services

TABLE 2 FEASIBLE STATE FOR FRAME I

Code	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Conventional Transportation Services																				
C1	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N
C2	Y	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	N	N	N	N	N	N	N	N
Online Transportation Services																				
O1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N
Government																				
G1	Y	Y	N	N	Y	Y	N	N	Y	Y	N	N	Y	Y	N	N	Y	Y	N	N
G2	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N

The preference for each decision makers in this frame is as follow:

- Conventional transportation services:
  $17 \succ 9 \succ 13 \succ 1 \succ 5 \succ 18 \succ 19 \succ 10 \succ 14 \succ 11 \succ 15 \succ 2 \succ 6 \succ 3 \succ 7 \succ 20 \succ 12 \succ 16 \succ 4 \succ 8$
- Online transportation services:
  $13 \succ 5 \succ 9 \succ 1 \succ 15 \succ 7 \succ 11 \succ 3 \succ 14 \succ 6 \succ 10 \succ 2 \succ 16 \succ 8 \succ 12 \succ 4 \succ 17 \sim 19 \succ 18 \sim 20$
- Government:
  $9 \succ 1 \succ 13 \sim 17 \succ 5 \succ 11 \succ 3 \succ 15 \sim 19 \succ 10 \succ 7 \succ 2 \succ 14 \sim 18 \succ 6 \succ 12 \succ 4 \succ 16 \sim 20 \succ 8$

The graph model for this frame can be found in figure 2. This figure means, to move from the status quo scenario (scenario 3) to a better scenario, Government needs to move to scenario 1 by revoking the regulation num. 32 of 2016. Conventional transportation services also can have a better scenario by stop conducting intimidation and violence to online transport drivers.
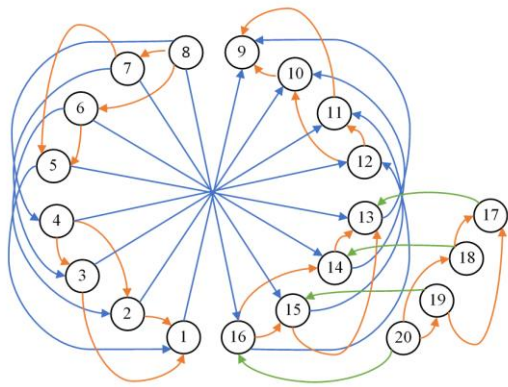
Fig 2 Graph Model for Conflict in Frame I

From figure 2, it can be seen that scenario 3, the status quo was unstable, where two decision-makers were willing to move from their current position to have a better scenario: conventional transportation services and government. The equilibrium, in this case, is scenario 9. However, its government moves that brought this conflict into another frame, frame II in this research, when it issued the Ministry of Transportation regulation num. 108 of 2017.

C. Frame II

This frame started when government move and issued ministry of transportation regulation num. 108 of 2017. Since there are a lot of new requirements that need to be fulfilled by the online transportation services, the drivers started to protest and held a demonstration. However, while this regulation is perceived as beneficial to conventional transport drivers, they still conduct intimidation and violence, especially in "red" areas. The options for this frame can be seen in Table 3 below.

TABLE 3 OPTIONS FOR EACH DMs IN FRAME II

Code	Option
Conventional Transportation Services	
K1	Conduct intimidation and violence against online transport

Online Transportation Services	
O1	Held mass demonstrations
O2	Operating
Government	
P1	Act upon the violence and intimidation faced by online transport drivers
P2	Revoke regulation no. 108 of 2017
P3	Appeals for online transports to stop operating temporarily

The preference of decision-makers in this frame is shown in Table 4. In this table, we can see that there are 26 feasible scenarios, which are derived from 64 combinations of possible outcomes. Scenarios that are removed are as follow:
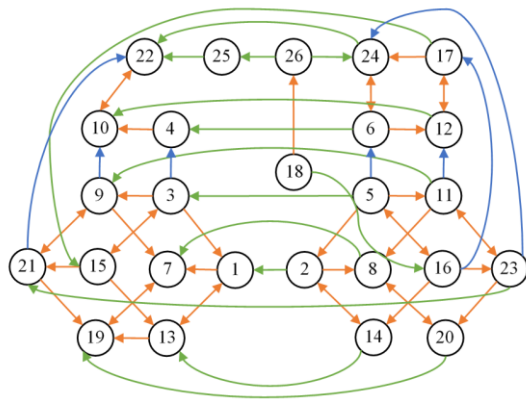
- When online transportation services stop operating, conventional transport drivers won't be able to conduct any kind of intimidation and violence against them. Thus, there won't be any necessary appeals for online transport to stop operation taken by the government.
- The government won't be able to act upon the violence and intimidation if there are no intimidation and violence done by the conventional transport drivers
- The condition of conventional transportation driver did not conduct any intimidation and violence against online transport, government revokes the regulation no 108 of 2017 and appeals for online transport to stop operating, whereas online transportation services held mass demonstration is unlikely to happen.

In this frame, scenario 7 is the status quo, where conventional transport drivers were conducting intimidation and violence against online transport; online transportation services held mass demonstrations and in operation; and government act upon the violence and intimidation faced by online transport drivers, did not revoke regulation num. 108 of 2017 and appeals for online transports to stop operating temporarily.

TABLE 4 FEASIBLE STATE FOR FRAME II

Code	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Conventional Transportation Services																										
C1	Y	Y	Y	N	Y	N	Y	Y	Y	N	Y	N	Y	Y	Y	Y	N	N	Y	Y	Y	N	Y	N	N	N
Online Transportation Services																										
O1	Y	N	Y	Y	N	N	Y	N	Y	Y	N	N	Y	N	Y	N	N	N	Y	N	Y	Y	N	N	Y	N
O2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	N
Government																										

G1	Y	Y	N	N	N	N	Y	Y	N	N	N	N	Y	Y	N	N	N	N	Y	Y	N	N	N	N	N
G2	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N
G3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N

In this frame, the scenario preferences for each decision maker are as follows:

- Conventional transportation services:
  $26 \succ 8 \succ 20 \succ 18 \succ 25 \succ 12 \succ 24 \succ 2 \succ 14 \succ 7 \succ 19 \succ 11 \succ 23 \succ 6 \succ 17 \succ 10 \succ 22 \succ 1 \succ 13 \succ 5 \succ 16 \succ 9 \succ 21 \succ 4 \succ 3 \succ 15$

- Online transportation services:
  $13 \succ 1 \succ 14 \succ 2 \succ 15 \succ 4 \succ 3 \succ 17 \succ 16 \succ 6 \succ 5 \succ 19 \succ 7 \succ 20 \succ 8 \succ 22 \succ 21 \succ 10 \succ 18 \succ 9 \succ 24 \succ 23 \succ 12 \succ 11 \succ 25 \succ 26$

- Government:
  $8 \sim 20 \succ 7 \sim 19 \succ 2 \sim 14 \succ 17 \sim 12 \succ 6 \sim 24 \succ 26 \succ 1 \sim 13 \succ 11 \sim 23 \succ 10 \sim 22 \succ 25 \succ 9 \sim 21 \succ 18 \succ 5 \sim 16 \succ 4 \succ 3 \sim 15$

Notes:
→ Conventional transportation services' moves
→ Online transportation services' moves
→ Government's moves

Fig 3 Graph Model for Conflict in Frame II

The graph model in this frame can be found in figure 3. In this graph, we couldn't find the equilibrium because of the indecisiveness of the government, where the government is indifferent whether to appeals for online transports to stop operating temporarily or not.

IV. CONCLUSION

Based on the previous section, we can conclude that in the first frame the decision makers, government and conventional transportation services, was a willing move to the status quo scenario to another scenario. Eventually, the conflict was developed into frame II by the move of the government. In the second frame, the status quo is stable for everyone (equilibrium), where no decision-makers were willing to move to another scenario.

REFERENCES

[1] S. T. Jin, H. Kong, R. Wu, and D. Z. Sui, "Ridesourcing, the sharing economy, and the future of cities," Cities, vol. 76, pp. 96-104, 2018.

[2] M. I. Rosyadi, "Aplikasi Uber di Indonesia Resmi Tamat," detikInet, 9 April 2018. [Online]. Available: https://inet.detik.com/business/d-3960984/aplikasi-uber-di-indonesia-resmi-tamat. [Accessed 13 July 2018].

[3] T. Berger, C. Chen and C. B. Frey, "Drivers of Disruption? Estimating the Uber Effect," European Economic Review, 2018.

[4] K. Kim, C. Baek, and J.-D. Lee, "Creative destruction of the sharing economy in action: The case of Uber," Transportation Research Part A, vol. 110, p. 118–127, 2018.

[5] C. Watanabe, K. Naveed, P. Neittaanmaki and B. Fox, "Consolidated challenge to a social demand for resilient platforms - Lessons from Uber's global expansion," Technology in Society, vol. 48, pp. 33-53, 2017.

[6] D. M. Kilgour and K. W. Hipel, "Conflict analysis methods: The Graph Model for Conflict Resolution," in Handbook of Group Decision and Negotiation, New York, Springer, 2010, pp. 203-222.