The Role of Collaborative E-Government in Surabaya Intelligent Traffic System
(A Study on Lane Traffic Accidents in Surabaya)

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ABSTRACT. The rate of accident in Surabaya City keeps increasing and becomes more complex as the society still tends to use private vehicles. This situation has led to bad impact, i.e. uncontrolled accidents. Surabaya Intelligent Traffic Systems (SITS) one of e-government implementations aiming to improve the city safety, and to reduce accident rates in Surabaya. This study aims to analyze the role of collaborative e-government in SITS program. In addition, collaborative e-government needs four principles including value, technology, economic, and citizen driven. Through qualitative descriptive method, it was found that there were weaknesses in the coordination among the stakeholders and there was no legal rule to regulate SITS application. Therefore, Surabaya Government needs to enhance cooperation among relevant stakeholders to optimize the function of collaborative e-government as well as to establish a legal law to rule SITS.

Keywords: collaborative e-government, Surabaya Intelligent Traffic System, accident rates.

1. INTRODUCTION

Cities have become entities which attract many researchers' attention. Not only is the dynamism of its change so fast, but also almost 50 percent of the world population will move to city (Ansell and Gash 2008). This problem also happened in Surabaya, i.e. increasing population and high stream urbanization lead to various problems such as seen in the level of road traffic accidents. In Singapore, the level of surveillance activities has dramatically increased, especially in public space as on public transportation or road. People who are driving are recorded by the government for further government research data (Purwanti, 2016; Jiow & Morales, 2015).

TABLE 1. Graphic Of Traffic Accident And Public Order Violation

No	Year	Traffic Accident	%	Public Order violation (Theft with/without violence)	%
1	2015	1.136	34	8.354	33
2	2016	879	26	10.105	40
3	2017	1.365	40	7.063	28
	Total	3.380	100	25.522	100

Source: Processed data from Annual Reports of Surabaya years 2018 (BPS, 2018)

As seen in table I, traffic accidents extremely increased 40 percent in 2017 compared to that in 2016 at 26 percent. Meanwhile, on graphic of order violation it is stated that the highest violence is in 2016 at 40 percent. This value shows that Surabaya seems to still have high level accident until in the end of 2017; nevertheless public order violation shows a decreasing trend in 2017.

TABLE 2. Total Installed Cctv

Year	Installed CCTV
2019	612
2017	108
2015	58

Source: processed data from LAKIP Surabaya and SITS to improve the quality of public service in Transportation Office of Surabaya city

The emergence of smart city concept has encouraged Surabaya to innovate to be a city which is both comfortable and safe for its people. The government under the regulation Number 23 Year 2014 on Local Government Regulation, Chapter XXI states the innovation of local government of Surabaya about applying surveillance system to support digital city program. Surabaya has installed 612 surveillance security camera systems in 2019

and 23 cameras could do identification via face recognition (Eppstein 1998). Retrieved from *www.medcom.id* stated that by maximizing technology system, the government of Surabaya expected to be able to increase public awareness in driving and to improve the quality of community security (Wahyudrajad 2019). This research will analyze how collaborative e-government in managing Surabaya Intelligent Traffic System plays the role to control traffic accidents.

2. LITERATURE REVIEW
2.1 E-Government

Electronic government or popularly called e-government is used to improve quality of services between government entities (G2G), between government and people (G2C), between government and businesses (G2B), and other networks using information and communication technology (ICT) [3]. E-government is defined by Holmes as a term referring to the usage of innovation in specific, the usage of the web, provision of good public service, customer oriented and costs more effectively and get better results (Holmes, 2001; Deddy, 2020). E-government is defined by Holmes as a term referring to the usage of innovation in specific, the usage of the web, provision of good public service, customer oriented and costs more effectively and get better results (D Holmes 2001; Muslimin 2018).

The gap of transparency and information between citizens and the government might affect the level of public trust. Such condition felt by public towards government indicated a decline in public trust. Hence, improving information from the government to the public can help increasing public perceptions and influence expectations of trust by narrowing the information gap between the public and the government (Welch 2012).

E-government in Indonesia started in 2001 as initiated by Presidential Instruction No. 6 Year 2001 mentioning the government agencies and offices to apply telecommunication, media, and information in supporting interagency stakeholders. The ability to exchange information through government departments is described as one of the key components of the sharing of knowledge (Makedon et al. 2015).

The emergence of e-government encourages the city of Surabaya to create Surabaya Intelligent Transportation System. More over, based on the enforcement of "One Agency, One Innovation" regulation (Ministry of Empowerment of State Apparatus and Bureaucratic Reforms Regulation

Number 19 Years 2016) stating that every regency/city should make one innovation of public service in every year. Intelligent Transport System is the integration between information systems as well as communication technology and transportation infrastructure, vehicles and road users. The development of this system was initially carried out to reduce congestion and traffic accidents. However, the system in the end is now fully integrated among multi actors of stakeholders addressing in decision making.

Intelligent Transportation System has basically been developed in many Asia Pacific and Oceania countries, such as Singapore, Japan, Australia, Malaysia, South Korea, and China. In Singapore for instance, the implementation of transportation surveillance systems has a great impact on traffic management control, in some cases like traffic accidents the intelligent transportation systems had helped the police in investigation as supported with smart face recognition systems to enforces the regulation (Jiow and Morales 2015).

The concept of collaborative governance is a form of governance in which public and private actors work together in distinctive ways to establish laws and rules for providing public good service (Ansell and Gash 2008). Moreover, there are many ways to interpret collaborative governance. Typically the aims are to involve government, private, civil society, in achieving collective goals. In addition, some scholars use the term "collaborative" to describe a process to recognize by groups of interests (Purwanti, 2016).

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The discrepancies between these prominent concepts of collaborative governance indicate at least five dimensions; the first, this taps into the public-private parts and essentials digging whether collaboration seen may bring governmental and non-governmental actors together, the second dimension is collaboration which is initiated by public actors, and last dimension is related to a multi-organizational process, either restricted to organized

interests or also allowed for broad public involvements (Batory and Svensson 2019). Therefore it can be concluded that collaborative governance emphasizes on process design constructed by multi-actor partnership. Therefore it can be concluded that collaborative governance emphasizes on process design constructed by multi-actor partnership.

3. METHODS

This study used a semi-systematic review approach to analyze and identify the knowledge gaps based on descriptive qualitative study. This provides an understanding of complex area and the aims to build the state of knowledge, and the ability to map a field of research (Snyder 2019). Moreover, previous studies, book and summary reviews were used to explain and review the role of collaborative e-government in Surabaya Intelligent Transportation System.

4. RESULTS AND DISCUSSIONS

4.1 Collaborative E-Government in Managing Road Traffic Systems

Information and technology cannot currently be divided by organization, whether profit oriented organizations or nonprofit oriented ones. The adoption of technology in government sector aims at the provision of good information as an effort to enhance services to the public in order to increase transparency, effectiveness, efficiency, accountability in the administration of government.

According to the Open Government Directive (2009), Collaboration strengthens the effectiveness of government by promoting alliances and collaboration within the central Government, across government levels and within the government, and private sectors. Collaboration emerges due to a desire for sharing culture and integrated regulation to improve efficiency, effectiveness, transparency, and accountability in administering the government. Meanwhile factors influence the creation of e-Government, Richard (2014) argues that the key enablers for e-Government remain technology, citizens, and processes. Its also supported with Al-Khouri (2012) and Richard (2014) claims that the core of e-Government encompass citizens, technology, value and economy. Collaborative e-Government framework considering as follows:
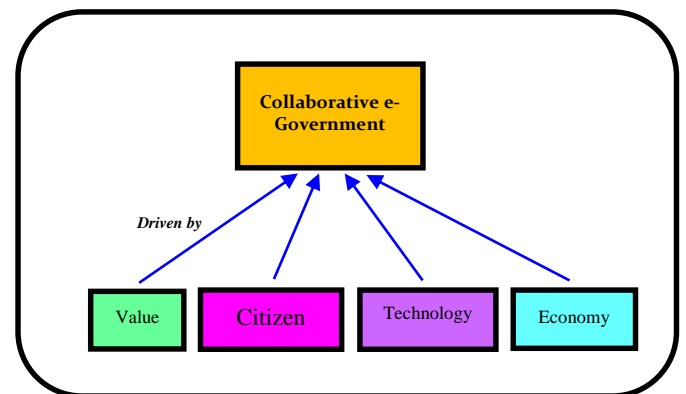

FIGURE 1. Supporting factors of collaborative e-government

4.2 Value

Value driven factor made the government should provide better decision making capabilities, boost good service provisions and achieve domain specific goals. In addition, value has a big impact as how the implementor create more innovation to answer all of restraining factors. The program of "one agency, one innovation" has triggered the government to solve traffic accidents problem. Collaboration in managing traffic is an important way to deal with not only one actor to support the SITS but also to decrease the accidents. The government has managed cooperative works among Transportation Office, Big City Resort Police ((Local term: Polrestabes) of Surabaya, Court (local term: *Pengadilan Negeri*) of Surabaya to crack down traffic offenders.
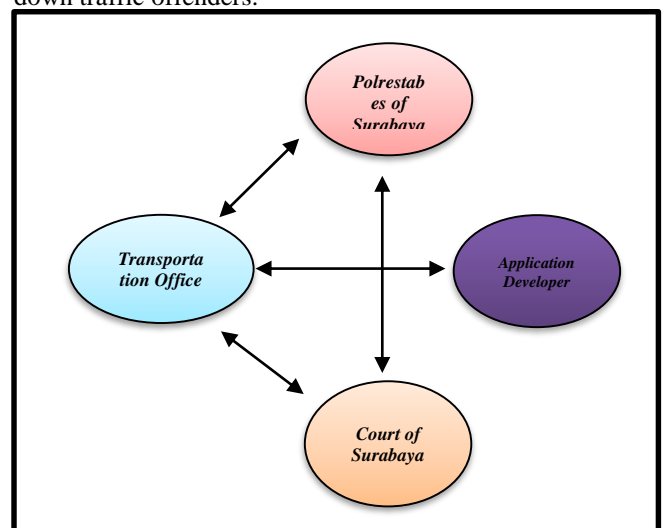

FIGURE 2. SITS concept

4.3 Citizen

The citizen force has driven the government to provide citizen participation platform where they could participate and interact with the governments.

Figure 3. SITS Information through Facebook

Citizen involvement is also the success key in managing road traffic accidents. By SITS application, the community is allowed to access current traffic situation, or also possible to directly report to government if there is any accident. Through Facebook and twitter, SITS also distributes video recordings for public as a form of education on various types of violations committed by drivers and openness about current incidents, SITS even uses facebook as a channel to embrace to society.

4.4 Economy

Efficiency is a factor to create ITS system in managing road traffic accidents. A lack of Human resources is the biggest challenge in enforcing traffic laws (Sulistyanto 2017). The small number of police resources had affected the management of traffic system, as the ideal structure is 1:350, instead it was currently 1:750 coverage in one zone (city/district) in 2017 (Movanita 2017).
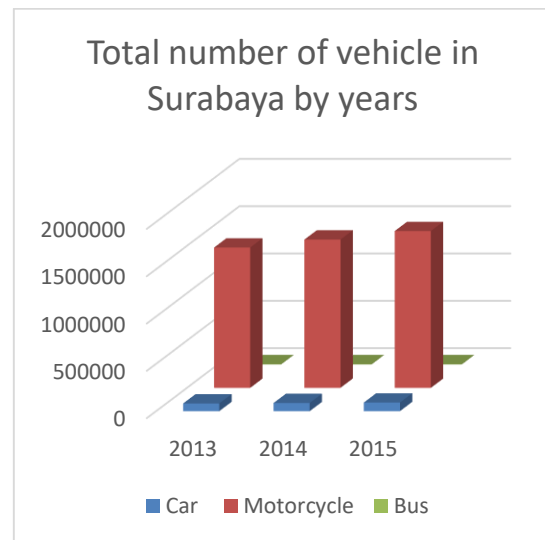

Figure 4. Total number of vehicle in Surabaya City

As table shown it can indicate that from years 2013 until 2015 motorcycle had dominated the roads in Surabaya. The number of motorcycles in Surabaya was 1.655.891 in 2015, while the number of cars at 91.043 and lastly the number of bus at 2.936 in 2015 (BPS 2018). It can be seen that this was not proportional concerning the comparison on the number of human resources to surveillance and to carry out the function of law enforcement. Hence SITS is significantly necessary to assist the task of regulation to prevent such conditions as crime, as well as to manage the number of vehicles thus the number of accidents can eventually be reduced. In addition, by adopting technology, it can save budget. It also has a great effect for Surabaya city that it can save such budget as spending on procurement of papers for ticketing which are replaced by electronic mail (Wijayanto 2019).

4.5 Technology

Technology-driven forces have encouraged policy makers to cooperate and to innovate by offering complementary and easy-to-use communication resources and networks. Technology also helps the government to connect multi actors and to continuously innovate over collaboration, for instance enable to sync data, people and resources together. According to Gray (2017) technology also play a main role as collaboration tools. However it is also considered on whom it is implemented. The successful of technology adoption is really complex context because it was rely on conceptualization, design, implementation, adoption, and usage (Bwalya 2018).

SITS integrates ICT with transport engineering to carry out the planning, operation, maintenance and regulation of the transportation system. Additionally, SITS system also synchronize with civil registry service (local term: *Disdukcapil*) in which the system works if someone violates the traffic, the violator will be automatically be recorded in the ITS database in the form of a face, vehicle plate number, type of vehicle used, time of the incident, and also the offenders or violators are required to pay the fine within 15 days. Furthermore, if they do not confirm the system, they will be automatically blocked by electronic registration and identification (ERI) (Sulistyanto 2017).

4.6 The Barriers of Surveillance System in Surabaya

In Singapore, the level of surveillance activities conducted by the authorities has increased dramatically, especially in public places such as on public transport or on the road. Drivers have also been recording videos of their driving experiences and publicizing controversial driving behaviors. In some serious accidents, the police will also use the recordings for prosecution purposes (Jiow and Morales 2015). However, the implementation of Surveillance systems in Jakarta has an impact on deterrence towards the perpetrator as there will no reason to be denial (Abdi 2018). In a nutshell, CCTV is effective at detecting, reducing violation, and peventing any types of crime acts (Taylor, Lee, and Willis 2017; Wells et al. 2006). Surabaya which has applied a new technology met a disruption as a common city with a new technology uptakes a new challenge to be adapted by the people.

According to Merilee S. Grindle in Subarsono (2005) successful implementation is affected by two variables, content of policy and context of policy. Additionally, content consists of how was the target group interest in content of policy, the benefits by target group, and whether the program is on target. On the other hand, the context covers strategic actor, characteristics of agencies, compliance and acceptances. As other metropolitan cities, implementation of surveillance system faces such obstacles as lack of understanding and obeying the rules, insufficient of coordinating among agency, and overlapping of the regulations. Grindle Theory was used in this study to analyze the problems.

SITS is a special platform for integrating traffic. Nevertheless, SITS still faces some obstacles such as in controlling, especially at the time of reporting. This is due to the fact that SITS platform is different to human eyes in which the community has the option to directly interact with stakeholders related to these problems or can press the panic button on the application system. Meanwhile, SITS is only limited to the community

4.7 External Barriers

4.7.1 Lack of Understanding on Traffic Regulation

As seen in table 1, it can be concluded that the understanding and the awareness to obey traffic rules in Surabaya are still weak. Thus, the government and police department should make socialization or dissemination about traffic awareness as their necessity.

4.7.2 Unstable Electricity

The program will succeed if it is provided with adequate facility and infrastructure, while sometimes Surabaya had unstable electricity condition as mentioned by (Sari 2018); SITS (Surabaya Intelligent Traffic System) has problems related to communication networks, while the electricity is down, it affects the surveillance system (CCTV). The capacity of Internet also has different quality which creates another challenge to provide equally speed internet in Surabaya.

4.8 Internal Barriers

4.8.1 Regulation must follow the dynamic of life

The highly dynamic culture of city life will certainly have an impact on new challenges in meeting quality public services. According to Solution Architect Ericsson Indonesia (Setiaji 2019) retrieved from Techinasia.com, IoT (Internet of Thing) has 3 main elements, i.e. Physical infrastructure, Internet Network and Application. Hence, the government under Presidential Regulation Numer 95 year 2008 about One Data Nation is supposed to make an integration wthin inter agencies to strengthen, thus the results can be used as a reference for decision making in planning development and problem solving.

4.8.2 Coordination among stakeholders are weak

The accident when Gubeng Street was sink in 2018 and was successfully resolved not more than one week was one of governmental breakthroughs in terms of public service. Through surveillance camera, the government was able to monitor the roadwork progress. Therefore, the government should learn and will be enforced to build coordination among multi stakeholders in reducing the number of traffic accidents. Surabaya as a leading government in Intelligent Traffic System in

East Java also has collaborated with other regional governments to support the implementation of SITS and conducted transferring knowledge as well.

On the other hand, Law Enforcement of E-TLE was still considered unsuccessful, the government was not be able to integrate data on vehicle owners. Furthermore, it needs coordination among Transportation office, the Police, and other related agencies; otherwise if there was any prosecution, itwas only settled for Surabaya (Haq 2019). At last, the number of cameras installed up to 2019 was 23 which were able to identify details of violations. In conclusion, there was a need to increase the number of CCTV, and improve coordination among stakeholders.

5. CONCLUSION

Overall, the findings of this study suggest that collaborative e-government is significantly necessary to be implemented. Additionally, the success in collaborating intelligent traffic system is influenced by a sustained value driven, citizen driven, economic driven, and technology driven. This study is expected to basically contribute to the literature as the findings are closely related to multi stakeholders' theory consisting of government, business, academician, non-government organization, and mass media. Hence, this model is immensely useful to respond what society need and to create a better collaboration considering the elements of collaborative e-government.

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