A Conceptual Model for eParticipation Using an Actor-Network Theory (ANT) Approach

Isyaku Uba Haruba[1, a], Maslinda Mohd Nadzir[2, b] and Hapini Awange[2]
[1]*(Universiti Utara Malaysia: School of Computing, Federal University Dutse: School of Computer Science)*
[2]*(Universiti Utara Malaysia: School of Computing).*
[a] *Isyaku Uba Haruna: ishaqkiyawa@ymail.com*
[b] *Maslinda Mohd Nadzir: maslinda@uum.edu.my*

Abstract— Theoretically, this paper has addressed the issues of eParticipation framework related to Nigerian public policy formulation and which can be suited under specific socio-technical context. The paper conceptually explores on ways in which citizen participation are translated into a framework of eParticipation. Besides, this research holds a sociotechnical concept and uses an Actor-Network-Theory as its theoretical foundation in influencing the interaction between people with Information and Communication Technology (ICT). In accordance with different literature, the ANT as a framework to understand eParticipation for public policy formulation. Focusing on a Nigerian public policy formulations' case studies, this study proposes an eParticipation framework on public policy formulation. It is initially anticipated to be supportive of fitting under the context of any country sociotechnical which can be initiated by the citizen.

Keywords — Public participation; Public policy formulation; Actor-Network-Theory (ANT); Socio-technical; Framework.

I. INTRODUCTION

In the process of normalizing and making public participation a success, governments must create an environment that would enable citizens to say their understandings online and more highly, to create a comment rooms that may show the citizens' feedback and show to them that their responses are certainly considered. However, a sincere trust is required between the governments and its citizen as well as a reliable infrastructure that would enable the groups to interact with one another. Over the past few decades, there has been an increasing number of studies that needs to develop new ways or mechanisms for public participation that would enable a broader audience to contribute with their understanding to the public policy and in where their effort may be as well considered in more depth (Berry et al., 2019; Bin Salamat & Bin Hasan, 2011). A new form of public participation has been projected in changing the conventional governmental to sharing, independent, open, transparent as well as reliable systems. Electronic participation or eParticipation as a subset of electronic government (eGovernment) and electronic democracies (eDemocracies) is the new means of the conventional public participation (Abu-shanab, 2013; Berry et al., 2019; Capano & Pavan, 2019; Din et al., 2017). This is based on the coming of ICTs that enable public involvement in the government's doings (Okeke-Uzodike & Dlamini, 2019; Salamat, 2015; United Nations, 2018).

Electronic participation has likely to generate an additional transparency in government by enabling publics to use an innovative system help that could reduce barriers to public participation in public policymaking (Capano & Pavan, 2019; Salamat, 2015). Electronic societies are being firm designed on themes like environment, politics, economic, health, education, as well as social issues and so on (Sæbø, Rose & Flak, 2008, p. 400). The number of citizens is increasing and becoming higher and higher, and their views are posting on such and other themes for the universal to realize and respond upon toward. They'd

forming their personal forms of eParticipation. Politicians are as well forming their ways of influencing their supporters to the virtual world constituency, which has departed higher and effective. The direct interaction through the uses of ICT mechanisms was unparalleled and steered in a period of straight discussion among the government and its publics (Joseph & Avdic, 2016; Sobaci, 2010). However, different literature reveals that an application of an innovative technologies could neither lead to improved participation in any societies (Alarabiat & Estevez, 2017; Gao & Lee, 2017; Naranjo-Zolotov, 2018). To an extent, it covers a processes of enhancing informal communication among participants, but not coming with any new members (Ibrahim, Taib, & Shahzad, 2016; Komito, 2005). Moreover, ICT mechanisms have been criticized for incapable of supporting a participatory technique that might need an essential change in the current context (Panopoulou, Tambouris & Tarabanis, 2014; Tambouris et al., 2007).

This study proposes an eParticipation framework by analyzing the existing public policy formulation in Nigeria's government by considering an ANT concept. The paper is structured as follows. Section 1 is overview of the study; section 2 explains the methodology used. Section 3 analysis of the proposes eParticipation framework in public policy formulation based on the findings. In conclusion, it is the discussion of the future work suggested in the study.

II. Theory as a Translating Method of eParticipation

There are different theories which are related to this study, and it includes; Arnstein's Ladder of Citizen Participation; Social Shaping of Technology (SST); Institution Theory; Structuration Theory; Stakeholder Theory; and Actor-Network-Theory (ANT). In this section, a translating mechanism of Actor-Network-Theory in the current practices of public policy formulation in Nigeria.

Problematization concept, as one of the ANT components is considered in defining the issues with four steps specifically identifying a group of users, identifying actors and their roles, and cause, as well as emerging an actor-network. Table 1 explained the whole steps below.

Table 1. Summary of the main concepts of the Actor Network Theory (ANT)

Concept	Description
Problematization	Refers to the determination of the actors of the networks and their identities, establishing an obligatory passage point in the establishment of networks (Bin Salamat & Bin Hasan, 2011; Callon, 1986).
Actor (or Actant)	Any entity that can cause effect represented by humans and, through semiotics, by non-human (Latour, 2001). Law stated that "society, organizations/government, agents and machines are all effects engendered in networks of many things" (Law, 1992, p. 380; Murro & Beuren, 2016).
Actor-Network	"A network with a certain shape of heterogeneous and diverse affairs, or an effect produced by influenced network." (Law, 1992, p. 5).
Obligatory passage point	It refers to a state that must occur for all actors to satisfy the interests that have been ascribed to them by the focal actor (principal actor). The principal actor defines the OPP through which the other actors must pass through and by which the focal actor becomes indispensable (Bin Salamat & Bin Hasan, 2011).
Translation	It is a process that is made up of four different stages: interessment, enrolment, & mobilization. It refers to the creation as well as alignment of the interest in Actor-Network. (Callon & Latour, 1981; (Cresswell, Worth, & Sheikh, 2010).
Interressment	Interressment comprises a process of convincing the other actors to accept and recognize definition of the focal actor (Callon, 1986; Yusuf et al., 2016).
Enrollment	Refers to task and coordination of possible roles to actors listed in problematization (Bin Salamat & Bin Hasan, 2011; Callon, 1986 Cresswell, Worth, & Sheikh, 2010; Salamat, 2015).
Mobilization of allies	It involves preserving commitment to a cause of action as well as the OPP (Callon, 1986; Cresswell, Worth, & Sheikh, 2010; Murro & Beuren, 2016).

III. Analysis
A. Identifying Group of Users

This study discovered group of users as a central element. These include; Organization Group that represent the core group of public policy; Technology, that acts as a network between the "public and governments' societies; and Publics (citizen) as the essential player. Other groups identified include; participation process as well as its encouragement process. This face of user involvement is important to be walkable with various information this includes various group of people as user. This research identified group of users in according to the approach follows and it is in order to understand the existing environment of eParticipation.

B. Identifying Actor with their Roles

In investigating the existing situations of public policy formulation, a review was led as well as using a case study. The term 'actor' is considered by applying ANT concept in representing each component that holds a connection to the effort. They are the central elements in the actor-network. They are defined as a component that lead to other essentials in need upon itself. Actors are acting as result of their association with others, and they are as well consider as nodes as well as central points in particular network. They can as well be entities that relate with other group of actors otherwise, they are considered in serving as an intermediate actor among a group. In comparison with other related theories, ANT exist with different entities that comprise of both human as well as nonhuman object. The ANT properties are categorically being dependent on their relationships depend on the network. The theory treats the entire component of a system also in realizing the connection among actors. Result from this review has revealed different actors include three main actors and three additional sub-actors involves in public policy formulation. These are presented in Table 2 below. It includes the entire actors together with their roles that links them in coming up with actor-network. Each of the actors has an individual role in supporting the public policy formulation processes.

Table 2. List of Actors and their Roles for the Proposes Framework of eParticipation

Government Society	Actors in charge of encouraging public (citizens) to participate in policy making process and educate citizen about policy making process and rationale behind it.
Public	Groups of actors in charge of participating in the public policy making process. It includes discussion with government groups or among one another, debate, recommendation and so on.
Technology	It is the network and instrument that mingle between government society and public society to help participation and encouragement

	processes.
Participation process	Its role is to support policymaking process and make the policy to have a strong quality, more legitimate as well as satisfactory.
Encouragement process	Its role is to educate as well as support public to participate in policymaking process.
Complex Factors	It is a group of drivers and barriers which are influenced eParticipation process.

Moreover, in finding the actors in this case, the current process of formulating public policy through review of the government document as well as the existing literature are identified. Even though the group has different process to contribute in public policy formulation, however, most are yet to have an accessible medium to allow their presence in public policy participation. The existing process of participation identified is through a representative process such as meeting, discussion, forum, emailing, phone call, web portal, bulletin board, training, workshop as well as conferences. These approaches can collectively work together as a tool. All approaches above appear to have shallow access. Certain individuals found it hard to involve, particularly for meeting as well as a discussion.

Though the participant can know not all information, rather many are supposed to see clearly on the way of formulating public policy at the minimum level. For example, emailing or phone calls are among the active tools for interaction through which actors got informed that a new public policy is or is going to be established. Nevertheless, the known could be considered as a perfect way to discuss regarding the policy. There are many emails otherwise phone calls that are usually engaged and received day-to-day. In several organizations, it is normal to see a sender as well as recipient retaining sending and receiving postal with a similar topic heading. However, this could be referred as postal that has been out of order. Since it could neither support the actors to control the information effectively. Besides, searching for an information in a bulk of emails could be an annoyed process.

Despite the lack of information on drafting public policy (Aminu et al., 2019), most public policies in Nigeria are made by Federal authorities that include president, ministers & directors (politicians) as well as the house of assembly (senate and representative). Meeting are conducted every week to review, advanced or initiate a new one. Senior bureaucrats from relevant ministries as well as agencies are the attendees (Ahmed & Dantata, 2016; Aminu, Tella, & Mbaya, 2012; Aminu et al. 2019; Anthony et al., 2015; Dialoke et al., 2017; Igbokwe-Ibeto & Osakede, 2017; Kemi, 2019). However, in some cases, the meeting includes private sectors' representative those from the civil society, where needed. Throughout the meeting, internal as well as international situation, materials available and constrictions, as well as execution capacity, are among the factors measured. Information is mostly existing within the space of individuals that have appeared in the meetings. Nevertheless, widely held group

of the society such as ' the ordinary citizens as well as the private organizations' that have a profound interest in the policy are neither directly included to enable them to say their opinion, assessment, knowledge, reflection, suggestion, accept or oppose the idea proposed by the government. Such has triggered the majority of publics to get it hard and difficult in accepting public policies (Ahmed & Dantata, 2016; Aminu, Tella, & Mbaya, 2012; Aminu et al. 2019).

C. *Identifying the Causes*

The term 'Problematization' could be defined as a possible cause that influences a particular problem. There is no single official platform that is dedicated to issuing information to the public. Information is being distributed to the public in several ways, which is restricted to inappropriate boundaries. Moreover, information and understanding are shared if more skilled persons join a particular discussion. In most cases, those that have no connection with key actors, they perhaps left behind. The existing website is among the key factors that lead to the absence of public involvement in the policymaking process with government. Meanwhile, discussion is the sonly opportunity public supposed to have at any location in Nigeria to say their views.

Another cause of the challenging is formed from the less participation of citizen. Presidency, Cabinet (Ministries & Agencies) and House of Representative (Senate & Reps) are usually the key folks involved. At the same time, the citizen in most cases, they have no exactly know what public policy direction and approach is in Nigeria. Such tradition is neither efficient as Nigeria is practicing a democratic government. Literature shows that the majority of the citizens in the country are not satisfied with the way public policy formulation occurs (Ahmed & Dantata, 2016; Aminu, Tella, & Mbaya, 2012; Aminu et al. 2019). Another cause of the problem discovered is the lack of awareness among citizen on public policy formulation (Aminu et al. 2019). From the review conducted, majority of the citizens are highly unaware of how vibrant their involvement is in formulating public policy certainly is.

D. *Identifying the Actor-Network*

Actor-network diagram is the most important in determining the connection of actors in their particular network. ANT has been described as an effective mechanism to picture the relationship among actors within the space of a system. The fundamental plans of ANT are enlightening in that it prompts to figure out the present individuals, places, as well as things that participants may undergo in any given system. Such has supported engineers in knowing the possible terms that their clients may leverage. In realizing the framework in which client consider these schemes, developers' duties are firstly to identify what as well as who is involved in the situations. In coming up with the possible actors in any given system, it is important to first planned to scheme these, since it may support the developers to get all the possible active

participants. Besides, the collaboration of entire possible involved actors of eParticipation system is presented in Figure 1 below. Any actor that fails to interrelate or set not to performs accordingly; the roles of the whole system may fail as well. In realizing the connection between actors as well as in order to be sure that all actors are necessary to work together. Two of the key component of ANT concept are needs to reflect.

E. Interressement

Different groups actors with their various roles contribute to various interest among the groups. Table 2 presents the group of actors with their various interest in encouraging citizen involvement in formulating public policy through eParticipation platform. ANT cover an essential idea of that, it does not only side at the human existence but as well the non-human existences includes objects, societies likewise a technology are as well into consideration of ANT theory. In addressing the main problem in this case, the focal actor specifically Presidency, and Cabinet (Ministries, Agencies) as well as House of Assembly (Senate & Reps) need to effort in encouraging other actors with full knowledge of eParticipation platform offered. The impression is to struggle and explain the citizen eParticipation framework. Other groups of actors must be alert of the ongoing problematization as well as their contributing believed that pay to the eParticipation framework development.

F. Identifying the Obligatory Passage Point (OPP)

OPP, is the point that must emerge for the entire actors in order to influence their interest. In this context, the phenomena is referred to question on the dimensions as well as concern of government (Presidency, Ministries, Agencies, House of Assembly) to the implementation and success of eParticipation platforms.

G. Identifying Obstacle and Enrolment

This study aims to come up with an appropriate medium of eParticipation for the civic group with contents. As it stands, the actual medium of system serves as an interesting factor. Thus, there is need to figure every role that may contribute to the success of the public involvement in formulating policy. With this, the Federal government has shaped a unit under the Ministry of Communication and Digital Economy to control and manage the offered platform. The unit is in charge for managing as well as maintaining such offered platform.

Another challenge discovered in implementing eParticipation site is the role of the site in stand-in as a one-stop midpoint for citizen involvement in formulating public policy. Electronic participation could fail when a very less group of publics got permission to allied. In understanding the whole public involvement, the unit in control of eGovernment under the ministry of communication and economic development must promote the platform of eParticipation, and it includes a

representative to helps capture full eParticipation stakeholders' group. A framework of ANT is used in this study to determine and understand the ongoing problem as well as case study translations. The framework captures the component of this theory, it is through which the factors of the problem that touch the entire stakeholders in the offered system are discovered. Hence, the focal actor must recognize the scope of which is to expand connection among the public groups over the offered site of eParticipation. It may enable then aligning their interest as well as parts in reaching the target scope. Nevertheless, the process must first go over OPP. Problems are known, and instrument for example formation of the committee is one of the mechanisms of intersegment in reaching the goal.

Through the consideration of the process of actor-network, the key players are identified, as well as their affairs among them are as well represented. In the context of this research, through the review of existing studies, documents, existing system of eParticipation, analysis of many eParticipation framework and other countries eParticipation platforms are considered. The conclusions show there are differences significant in the groups of actors as well as the networks that are in the ongoing process. Then what ANT precisely contributes to this study is that it helps in highlighting the connection of actors that do not differentiate among human with nonhuman actors. A system must hold both components (Salamat, 2015). When discussing a participation of citizen, in this case, one must consider that it as a heterogeneous link that fixes all actors that involve one another, and they must work together to support the network. Through seeing the relationships between actors, participation process, encouraging process, organizations and some other complex factors, it finds that "actor-networks" as the central structuring component of technology. Generally, one of significant failure of Information System (IS) study or IS change depends either on the user (Muhammad Yusuf, 2017) or the system reason (Salamat, 2015). The failure is often beginning as few aspects are discounted during the progress of the exploration or development. ANT does bite all single aspect of the component by seeing the entire associated actors, and even the component may be outdoor from the development's scope. The usual approach of IS does not just focus on the connection and public connection among actors. In contrast, in ANT, the feature of being strained as it is certain of the letdown in reaching the public connections may affect the weak connection.

III. Proposed eParticipation Framework in Public Policy Formulation

Through the reflection of the ANT concept and the results discovered from the review, requirements of eParticipation framework are proposes in this paper. The framework would be a supportive because its planned as well deliberate to suit under any settings of 'sociotechnical' that could be considered in any public agencies. In accordance with ANT translation, the proposes framework comprise of five central part in

supporting it creation such as presented in Figure 1 to 5 below.

In general, the proposed eParticipation framework is directing to "reach a public policy which may occupies to people will". In order to reach the target objective, there are three central components that are identified which include public, eParticipation supporting mechanisms and content or document. These will be reinforced with five structuring pillars which result from the process of ANT translation, includes 'the general public', 'the organization', the 'technology', 'the encouraging processes', as well as 'the eParticipation processes' component. The entire structuring blocks could be divided into two groups of components, specifically community and supporting mechanisms. Community section is also supported by 'public as well as organization structuring pillars, where both pillars will be contributing equivalent task, idea as well as worth to articulate a particular public policy that may be accepted by entire community. Differently, encouraging processes and eParticipation processes are hold by organization as well as Technology structuring pillars to sustain eParticipation platform. These structuring pillars may support public to participate and engage in formulating a public policy planned.

Hence, different studies include United Nations (2005) describes that there are three main stages in the entire eParticipation framework specifically e-Information (low level), e-Consultation (middle level) as well as e-Decision-making (high level) of participation (Le Blanc & Settecasi, 2020; United Nations, 2014; United Nation, 2018). The whole level represents citizen participation level. It may increase with an average point of openness value by the government to their citizen in formulating public policy. So, the connection as well as the supports designed by each structuring pillars will enable eParticipation to connect citizen with the government in public policy formulation.

IV. Conclusion and Future Research

ANT as a concept that was established in 80th by Callon, Latour and Law. The theory describes networks that involve heterogeneous or socio-technical elements known Actants like humans, technological artefacts, organizations as well as institutes. The actor in ANT is exclusive in which it has their theories, frames, context, metaphysics as well as ontologies. Latour (2004) defined ANT as a theory on the ways to study things, mostly when things are shifting speedily and where the limitations can be unclear. ANT is used to define something that does not appear entirely like a traditional form of system. Decent fieldwork often produces many descriptions. So, ANT is used as a data description from fieldwork and required descriptions when and where needed. ANT accepts that that 'social relations' are dependent among both the material and natural world.

ANT support in explaining and evaluating how social exploit, social processes, as well as social structures, work. ANT has been applied as well as executed not only from the technology part but as well in IT and its system. In the view of applying ANT concept, a case study is preferred in most situation. As discovered, there is an existing challenged of unaccommodating medium for ICT personnel in government. ANT concept is considered in translating the existing problem revealed as it requires. The translation concept is enclosed under the life cycle of IS method as phases and stages. Upon the conclusion of this study, it is revealed that the translation of ANT is firmly related to IS methodology. ANT, as a sociology theory, is established to able to adapt an IS notion. As discovered in this study, most government organizations in Nigeria do neither have nor promote eParticipation concept. In precise, lack of knowledge, as well as collaboration effort, are among the challenges to eParticipation in Nigeria. In a very rare public policy for example in education, economic, agriculture as well as health system, there is a vast absence of citizen eParticipation in the country. The future study can focus with an empirical evidence by determining citizens' view on the existing system of eParticipation offered by the Nigerian government.

REFERENCES

[1] Abu-shanab, E. (2013). E-Participation levels and Technologies. The 6th International Conference on Information Technology, 1–8.

[2] Ahmed, I.K. & Dantata, B. S. (2016). Problems and Challenges of Policy Implementation for National Development. Research on humanity and social sciences 6(15). 6065.

[3] Alarabiat, A., & Estevez, E. (2017). Predicting Citizens Acceptance of Government-led e-Participation Initiatives through Social Media : A Theoretical Model, 2855–2864.

[4] Aminu, A. a., Tella, C. M., & Mbaya, P. Y. (2012). Public Policy Formulation and Implementation in Nigeria. Public Policy & Administration Research, 2(5), 57–63. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&profile=ehost&scope=site&authtype=crawler&jrnl=22250972&AN=88999550&h=sH8fGHGZtbBgG20dPjuH0yMcx+z9YUuuXvCixdhaUlkPF4a5uR4bfM+mfg1PrZOxE3arlh3bpqItdo5lr/5ZVQ==&crl=c

[5] Aminu Alarudeen and Raifu Isiaka Akande. (2019). Munich Personal RePEc Archive ICT sector , output and employment generation in Nigeria : Input-output approach, (92917).

[6] Anthony Eniayejuni, N. S. E., & International. (2015). Citizen ' s Participation : Between Continuity and Change in Nigeria Anthony Eniayejuni. Mediterranean Journal of Social Sciences MCSER Publishing, Rome-Italy, 6(6), 328–334. https://doi.org/10.5901/mjss.2015.v6n6s1p328

[7] Berry, L. H., Koski, J., Verkuijl, C., Strambo, C., & Piggot, G. (2019). Making space : how public participation shapes environmental decision-making, 1–8. Retrieved from https://www.sei.org/publications/how-public-participation-shapes-environmental-decision-making/?utm_content=buffer5e5b7&utm_medium=social&utm_source=facebook.com&utm_campaign=buffer.facebook

[8] Bin Salamat, MA., & Bin Hasan, S. (2011). An Actor-Network Theory (ANT) approach to Malaysian e-participation framework, Proceedings of the 2011 International Conference on Social Science and Humanity IPEDR Vol.5. IACSIT Press, Singapore.

[9] Callon, M. and Latour, B. (1981). "Unscrewing the big Leviathan: how actors macro-structurereality and sociologists help them to do so", in Knorr-Cetina, K. and

Cicourel, A.V. (Eds), (16) (PDF) Effects of actor-network theory in accounting research. Available from: https://www.researchgat.

[10] Callon, M. (1986). Some elements of a sociology of translation: Domestication of the scallops and the fishermen of St Brieuc Bay. Retrieved September l3, 2009 from http://www.vub.ac.be/SOCO/tesa/RENCOM/Callon%20(l9 86)%20 Some%20element s%20of%20a %20sociology%20of%20transla.

[11] Capano, G., & Pavan, E. (2019). Designing anticipatory policies through the use of ICTs. Policy and Society, 38(1), 96–117. https://doi.org/10.1080/14494035.2018.1511194

[12] Cresswell, K. M., Worth, A., & Sheikh, A. (2010). Actor-network theory and its role in understanding the implementation of information technology developments in healthcare. BMC Medical Informatics and Decision Making, 10(1), 67. https://doi.org/10.1186/1472-6947-10-67

[13] Dialoke, I., O, U. F., & Veronica, M. I. (2017). Policy Formulation and Implementation in Nigeria: The Bane of Underdevelopment. International Journal of Capacity Building in Education and Management (IJCBEM), 3(2), 22–27. Retrieved from http://www.rcmss.com.

[14] Din, I. U., Xue, M. C., Ali, S., Shah, T., & Ilyas, A. (2017). Role of information & communication technology (ICT) and e-governance in health sector of Pakistan : A case study of Peshawar (ICT) and e-governance in health sector of Pakistan : Cogent Social Sciences, 7(1), 1–18. https://doi.org/10.1080/23311886.2017.1308051

[15] Gao, X., & Lee, J. (2017). E-government services and social media adoption: Experience of small local governments in Nebraska state. Government Information Quarterly, 34(4), 627–634. https://doi.org/10.1016/j.giq.2017.09.005

[16] Ibrahim, J. S., Taib, C. A., & Shahzad, A. (2016). The Behavioral Intention of Citizen of Nigeria on E-Government Service by Utilization of The Unified Theory of Acceptance and Use of Technology (UTAUT). Sains Humanika, 8(4–2), 41–46. https://doi.org/10.11113/sh.v8n4-2.1057

[17] Igbokwe-Ibeto, C. J., & Osakede, K. O. (2017). Public Policy and Citizens Participation in Ngor Okpala Local Government Area of Imo State, Nigeria 2011 - 2015. Management Studies and Economic Systems, 3(3), 149–158. https://doi.org/10.12816/0040228

[18] Joseph, S., & Avdic, A. (2016). Where do e-Government strategies take the Nordic nations? Electronic Journal of E-Government, 14(1), 2–16.

[19] Kemi, A. O. (2019). Nigerian Economy Challenges : Causes and Way Forward. A Journal of Economic and Finance, 10(2), 78–82. https://doi.org/10.9790/5933-1002017882

[20] Komito, L. (2005). e-Participation and Governance: Widening the net. The Electronic Journal of eGovernment, 3(1), Academic Conferences Ltd, pp 39-48.

[21] Latour, B. (2004). On using ANT for studying information systems: a (somewhat) Socratic dialogue. In C. Avgerou, C. Ciborra & F. Land (Eds.), The Social Study of Information and Communication Technology Innovation Actors and Contexts. New York: Oxford University Press Inc.

[22] Law, J. (1992). "Notes on the theory of the actor-network: ordering, strategy, and heterogeneity". Systems Practice, 5 (4), 379-393.

[23] Le Blanc, D., & Settecasi, N. (2020). E-participation: a quick overview of recent qualitative trends. United Nations: Department of Economic and Social Affairs Working Paper, 163(163). Retrieved from https://www.un.org/development/desa/CONTENTS

[24] Muhammad Yusuf. (2017). Towards a Theory of e-Participation: An Actor-Network Theory (ANT) Perspective. University of Portsmouth United Kingdom.

[25] Murro, E. V. B., & Beuren, I. M. (2016). Redes de atores na perícia contábil judicial: Uma análise à luz da Teoria Ator-Rede. Revista Brasileira de Gestao de Negocios, 18(62), 633–657. https://doi.org/10.7819/rbgn.v18i62.2743

[26] Naranjo-Zolotov, M. J. (2018). Determinants of information and communication technologies for the online citizen participation adoption in urban contexts. Universidade Nova de Lisboa.

[27] Okeke-Uzodike, O. E., & Dlamini, B. (2019). Citizens' E-Participation at Local Municipal Government in South Africa. Journal of Reviews on Global Economics, 8, 458–468. https://doi.org/10.6000/1929-7092.2019.08.39

[28] Panopoulou, E., Tambouris, E., & Tarabanis, K. (2014). Success factors in designing eParticipation initiatives. Information and Organization, 24, 195-213.

[29] Sæbø, Ø., Rose, J., & Flak, L. S. (2008). The shape of eParticipation: Characterizing an emerging research area. Government Information Quarterly, 25, 400–428.

[30] Salamat, M. A. Bin. (2015). DEVELOPING ELECTRONIC PARTICIPATION FRAMEWORK FOR PUBLIC POLICY FORMULATION IN MALAYSIA. DOCTOR OF PHILOSOPHY UNIVERSITI UTARA MALAYSIA 20l5.

[31] Sobaci, Z. (2010). What the Turkish parliamentary web site offers to citizens in terms of eparticipation: A content analysis. Information Polity: The International Journal of Government & Democracy in the Information Age, 15(3), 227-241.

[32] Tambouris, E., Liotas, N., & K., T. (2007). A framework for assessing e-participation projects and tools. In In proceedings of 40 the Annual Hawaii International Conference on System Sciences (HICSS-40). 90–99.

[33] United Nation. (2018). United Nations E-Government Surveys.

[34] United Nations. (2005). UN Global E-Government Readiness Report 2005: From E- government to E-Inclusion. Retrieve from: http://unpanl.un.org/intradoc/groups/public/documents/un/u npan02l888.pdf.

[35] United Nations. (2014). What we mean by Youth? Retrieved From: Retrieved from www.unesco.org/new/en/social-and-human-sciences

[36] Yusuf, M., Adams, C., & Dingley, K. (2016). Digital Citizen Participation within Schools in the United Kingdom and Indonesia : An Actor – Network Theory (ANT) Perspective. https://doi.org/10.3390/info7040069
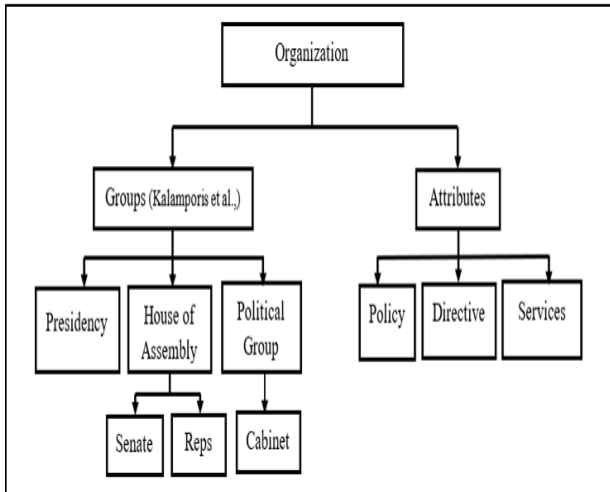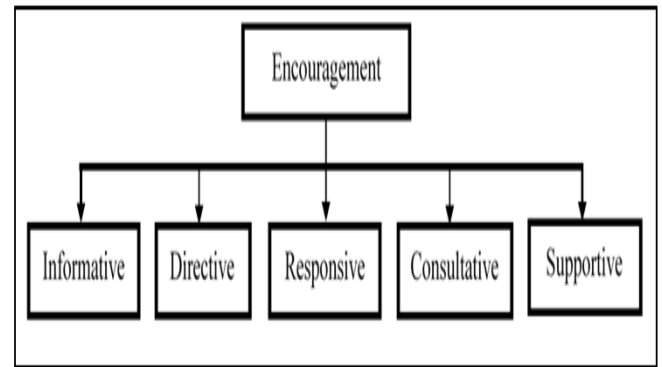
Figure 1: Organization as Sub-Actors
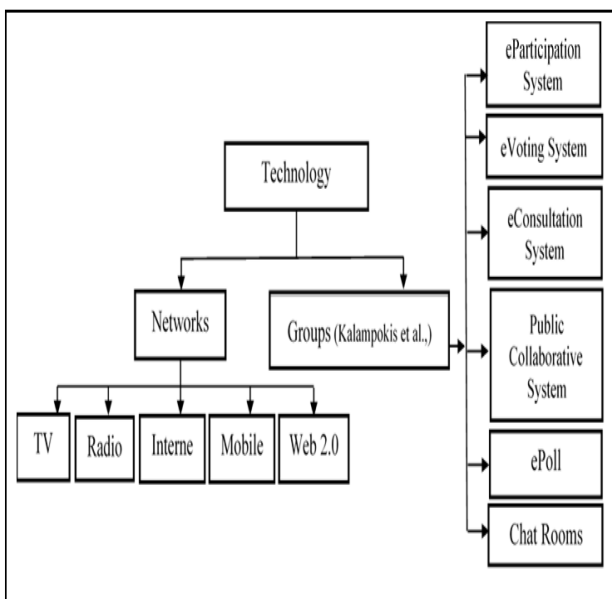

Figure 2: Public As Sub-Actor

Figure 3: Technology As Sub-Actor

Figure 4: Encouragement Process As Sub-Actor
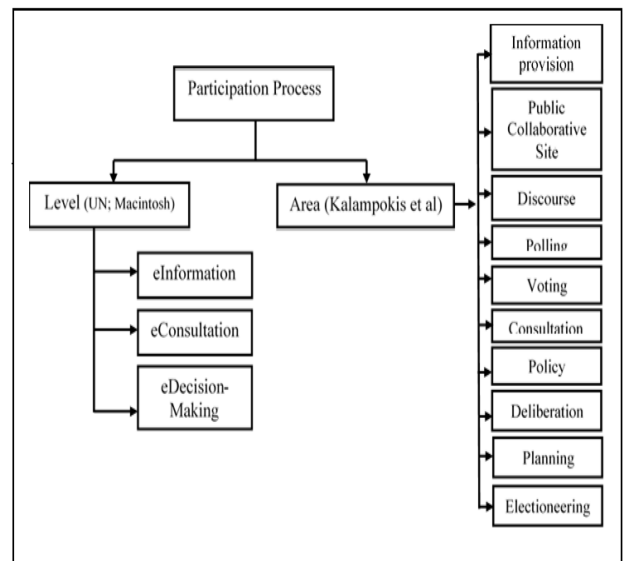
Figure 5: Participation Process As Sub-Actor