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Pasikola:
A Co-Creation Process in Urban Transportation Innovation of Makassar City, Indonesia

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ABSTRACT

In this digital era, innovation becomes an important element within urban planning and management to support a more effective and efficient urban service. Until now, most of the local governments in Indonesia still rely on a fully top-down approach to solve urban transportation problems. This article investigates the co-creation process in solving an urban transportation problem in Makassar City, Indonesia, by analyzing key success factors of the process. A literature review and semi-structured interviews were used to gather data from key actors involved in the process. It revealed that there are five important factors contributing to the success of a co-creation process, namely back up from the mayor, diversity of stakeholder involvement, local NGO facilitation, international NGO facilitation, and a committed team. A combination of the top-down approach and co-creation, as a participatory approach, and utilization of digital means seems to offer an opportunity for a more effective and impactful urban solution implementation in a contemporary (Indonesian) city.

KEYWORDS

Co-Creation, Collaboration, Digital Era, Innovation, Participatory, Top-Down

1. INTRODUCTION

In 2018, 55% of the world total population lived in an urban area and this number will increase to 68% in 2050 (United Nations, 2018). This phenomenon is occurring not only in developed countries but also in developing countries, like Indonesia. Negative impacts emerge as a result of this urbanization process, such as crime, urban heat island impact, pollution, slum area development, increasing waste generation, worsening water quality and water quantity, growing unemployment, and traffic congestion (Pawan, 2016; Uttara, Bhuvandas, & Aggarwal, 2012). Most of these impacts are related to the urban environment which directly affects people living there.

Focusing on traffic congestion in Indonesia, the driving force behind it is the increasing number of private vehicles and poor or even lack of public transportation provision or its maintenance (Leung, 2016). One of the cities which face this problem is Makassar City in Indonesia. Makassar is a metropolitan city consisting of 1,48 million people in 2017 with a total area of 175,7 km^2 (Central Bureau of Statistics of Makassar Municipality, 2018) (see Figure 1). Similar to other cities in Indonesia,

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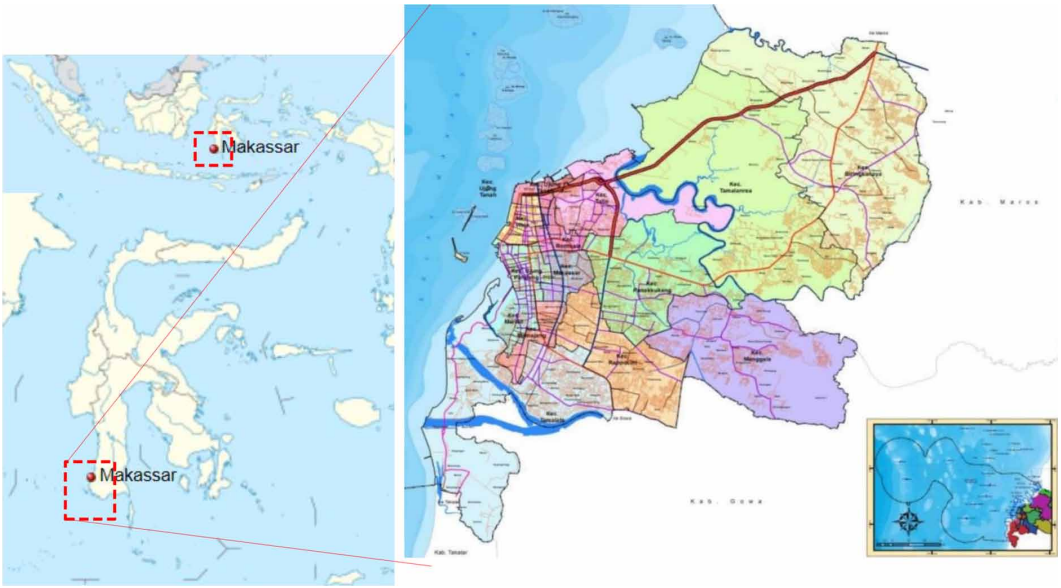
Figure 1. Administration map of Makassar City (Source: Makassar Municipality, 2014)



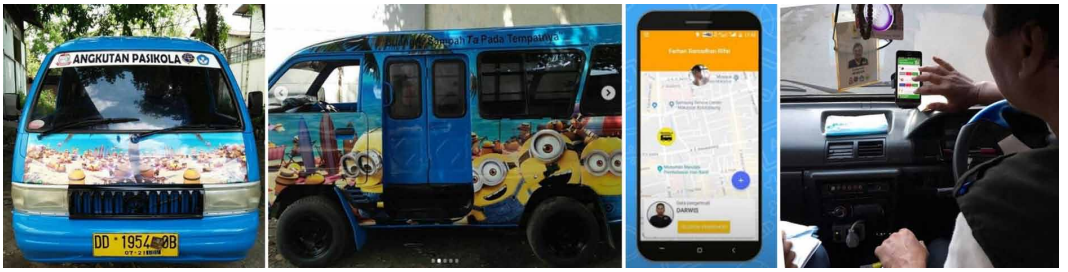
most people prefer to use a private vehicle rather than public transportation; this turns out to be one of the reasons for traffic congestion in the city (Pulse Lab, 2016). According to the Central Bureau of Statistics of South Sulawesi Province (2016), there were about 1 million motorcycles and 190 thousand cars in Makassar City but unfortunately without any improvement of road services. There are two types of public transportation in Makassar, the formal category owned by the government (bus rapid transit) and the informal category owned by private/individual persons (*pete-pete* or public minibus, *bentor* or motorized pedicab, and mobile app-based transportation service, like *GoJek* and *Grab*). Pulse Lab (2016) revealed that public transportation in Makassar is not effectively used by the people because public transportation is considered to be not reliable, not comfortable, and not safe enough, so people prefer to use their own vehicle. All of the implemented solutions to cope with the Makassar City transportation problem were mostly adopted via a top-down approach, evident from the Mayor's program on "Smart *Pete-Pete*" and "Bus Rapid Transit (BRT) *Mamminasata*", by a spatial and mid-term development plan arranged by the Planning and Development Agency, and by a local transportation system plan called *"Tatralok"* arranged by the Transportation Agency.

To cope with the problem, in 2016, the Mayor agreed to collaborate with UNDP Bangkok Regional Hub (BRH) together with Pulse Lab Jakarta – a semi-governmental organization focusing on human-centered design and big data study – and a local NGO, called BaKTI, to come up with a tangible solution. This program was part of the City-I-Leaps[1] initiative, a joint initiative between UNDP BRH and the Seoul Metropolitan Government, which aims to cope with an urban problem using a design thinking approach by collaboratively seeking for a solution, and develop, test, and upscale it throughout the area (Pulse Lab Jakarta, 2016). They came up with a participatory approach called co-creation (based on user-centered design) in the process of a solution generation, development, and implementation. Therefore, co-creation term used in this paper refers to the participatory approach for generating innovative idea for urban transportation. The approach was divided into four main phases, namely a mobility study, a design workshop, an incubation period, and a pilot project implementation. In all the phases, stakeholders from different sectors were involved to look for any potential solutions based on problems identified in the mobility study that was conducted earlier. In 2017, a new solution emerged from the process named *"Pasikola (Pete-pete anak sekola)"* which tried to reduce traffic

congestion by transforming a *pete-pete* or public minibus into an elementary and junior high school shuttle service equipped with a mobile application called *e-Pasikola* to be used by the driver and parents (see Figure 2).

The project leader said that *Pasikola* is effectively reducing traffic congestion on roads nearby the school in the morning and afternoon as there are less private vehicles used by parents to drive

Figure 2. Pasikola vehicle and e-Pasikola mobile application (Source: Epasikola, 2019)



their children to and from school. This solution is now part of the Makassar City Transportation Agency as there is a growing number of demand from private/individual "*pete-pete*" owners to register their cars as *Pasikola* and from schools and parents to join the initiative. The success of the initiative gained several appreciations both at national and international level, such as the Smart City Innovative Application Awards 2018 by the Smart City Association in Taiwan and The Champion of Smart Solution for Public Transportation in Co-Creation Competition 2018 by CGen Indonesia. All efforts towards that success are worth to be researched to reveal any potential aspects that can contribute to the appreciated outcomes.

Apart from the solution, the most important value that we wanted to reveal in this paper was the process of generating *Pasikola* as an experiment of a co-creation approach in solving local transportation problems with a small-scale project using also "e-oriented" techniques[2]. Then we linked it to the current top-down approach practice. We expected that from a reflection on the process, an effective approach to cope with urban transportation problems could be derived. The paper also included an analysis on each phase in the co-creation process, the influence of stakeholders, and success factors of the process.

This paper aimed to investigate the co-creation process in reducing an urban transportation problem in Makassar City, Indonesia, by analyzing key success factors within the process. To achieve the aim, we formulated three research questions: (1) which processes were applied in the co-creation process of *Pasikola*? (2) what stakeholder interaction took place in the co-creation process of *Pasikola*? (3) what success factors could be identified during the process and inside the stakeholder dynamics in the co-creation process of *Pasikola*? Looking for answers to these research questions we mainly applied two theoretical lenses, namely theory about co-creation, including co-creation process and its relation to transportation solutions; and about participatory approaches in planning, including collaborative planning and motivation in a collaborative environment. We also elaborated the digital means used in the process and solution as an element of planning in this digital age.

2. THEORETICAL APPROACH

2.1. Co-Creation Process

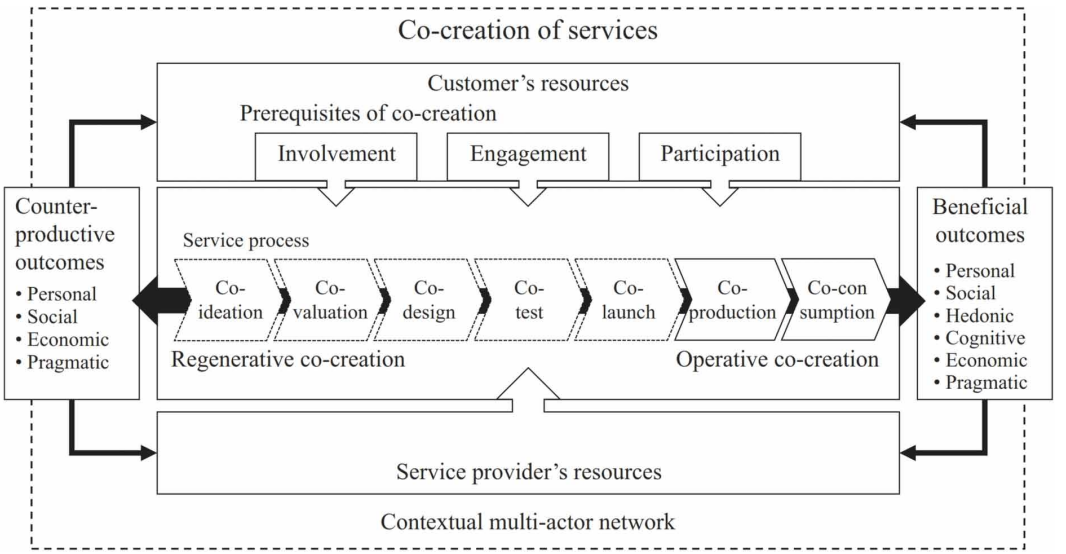
Co-creation is an emerging concept in the public sector, which helps to cope with any societal problems at every spatial scale (neighborhood, city, and region) (Baptista, 2019). Currently, most governments

try to cope with public challenges by approaching them together with citizens and non-governmental sectors, aiming to exchange resources, share notions, and bring beneficial outcomes for public deliverables (Voorberg, Bekkers, Timeus, Tonurist, & Tummers, 2017). Oertzen, Odekerken-Schröder, Brax, & Mager (2018) revised the definition of co-creation so co-creation denotes collaborative activities in delivering any services by involving and engaging multi-stakeholder participants (at least one service provider and user) which leads to resources integration and takes place through several phases (co-ideation, co-valuation, co-design, co-test, co-launch, co-production, and co-consumption).

Torfing, Sørensen, & Røiseland (2019) added to this definition by focusing on its use in the public sector. They stated that co-creation is a process involving a minimum of two public and non-public sectors to deal with a shared problem by exchanging any resources between the participants and bringing innovative solutions for a better public deliverable. The public participant refers to politicians and government staffs. The non-public participant refers to private sectors, civil organizations, academics, local communities, or individual users. It is clear that co-creation is an approach to accommodate both the governmental and non-governmental sector to sit together and bring innovative solutions towards a specific shared problem through several phases. Voorberg, Bekkers, & Tummers (2015) added that in public co-creation the end-user is the citizen, which is the combination of public and non-public active participants.

Applying the definition at a city scale, the start of co-creation could come from either a local government or citizens (as a non-governmental party). An interaction between them to deal with a city problem can be stated as a "co-creation process" if it contains at least these elements: engagement, involvement, participation, learning process (collective intelligence), willingness to work with each other (flexible government), and innovative solutions (Oertzen et al., 2018; Putra, 2018; Voorberg et al., 2017). Furthermore, Oertzen et al. (2018) proposed an integrative framework of co-creation, which reveals the whole idea about co-creation (see Figure 3).

Figure 3. Co-creation integrative framework (Source: Oertzen et al., 2018)



In the transportation sector, co-creation is commonly used to understand the user's experiences and preferences in using a transportation service. Gebauer, Johnson, & Enquist (2010) and Nunes, Galvão, & Falcão (2014) described that co-creation, as a participatory approach in public transport, could be

conducted by digital crowdsourcing. Users could give their feedback on their journey experience while operators could give the users real-time information about the journey. The interaction can increase the effectiveness and efficiency of resources allocated for the public transport management (Davoudi, 2016). Furthermore, the most innovative ideas emerged from a co-creation in public transportation have to satisfy three key criteria, such as feasibility, utility, and innovativeness, in which utility becomes the most important criterion for the operator (Nalmpantis et al., 2019).

From the perspective of planning theory, co-creation could be seen as either participatory planning[3], transactive planning[4] or collaborative planning[5] (Voorberg et al., 2015). For instance, in participatory planning according to Arnstein (1969), co-creation can be a form of degree of citizen power, which can be in either partnership, delegated power, or citizen control. In the next section, collaborative planning will be elaborated as one of planning theories used in this paper.

2.2. Collaborative Planning

Voorberg et al. (2015) mentioned that co-creation also refers to participation, collaboration and community engagement concept. In this paper, we saw the project through the lens of collaborative planning. Most scholars define collaborative planning as the gathering of all stakeholders having different perspectives of specific planning issues to make a communal dialogue and build consensus as an effort in a policy-making process (Purbani, 2017; Ambruster, 2008; Harris, 2002; Healey, 1997). In this digital era, the communal dialogue and interaction can be conducted via crowdsourcing in which people can share their view on a project plan and give feedbacks until they reach a common vision on it (Brabham, 2009). In collaborative planning, all parties involved should have an equal power, which can be a way to build knowledge exchange, social contact, and political coalitions (Purbani, 2017; Ambruster, 2008). Thus, it emphasizes the utilization of communication and relationship among stakeholders involved in the process as a way to build a common vision and understanding. This common vision and understanding becomes a foundation for a decision-making process related to issues discussed. That way, a policy or plan can be implemented more smoothly as all stakeholders have agreed on the decision and it is the product of deliberative democracy.

Furthermore, Healey (1997) suggested two main elements of collaborative planning, namely soft and hard infrastructure (see Table 1). The soft infrastructure contains three sub-elements, namely

Table 1. Collaborative planning elements (Source: Healey, 1997)

Element	Sub-Element
Soft Infrastructure	- Relation building - Consensus building - Social learning
Hard Infrastructure	- Political structure - Administrative structure - Legal processes

relation building, consensus building, and social learning. Relation building refers to the way to start a network among stakeholders by connecting them and make them aware of each other. Consensus building refers to the process of gathering different perspectives from each stakeholder by moderating a dialogue among them and discussing it to achieve a common vision and understanding. Social learning refers to the learning process that is experienced by stakeholders during the relation and consensus building. The hard infrastructure consists of a political structure, an administrative structure, and legal processes. Political structure refers to the formal political power in governmental bodies, which may affect the consensus building process. Administrative structure refers to the governmental body

structure that may be involved in the policy-making process. Legal processes refer to the rules and regulations, which can be used as a guideline and legitimation during the process.

To have a successful collaborative planning, it is necessary to have insight in the stakeholders' motivation to be involved in a collaborative process (Curșeu and Schruijer, 2017; Grobelnik, 2017; Healey, 1998). Several scholars proposed a dichotomy of user's motivation into two types: intrinsic motivation and extrinsic motivation (Puerari et al., 2018; Vivek, Beatty, & Morgan, 2012; Yukl, 2010; Zwass, 2010). Intrinsic motivation refers to motivation coming from a participant's own desire to engage in a co-creation activity. The participant does not need any stimulant to participate in the co-creation process, as he/she wants to satisfy his/her desire. Extrinsic motivation refers to the emerging of participant's motivation because of an external stimulant, which will benefit him/her, such as monetary incentives, professional recognition, and network to authority.

These types of motivation can also be seen from their root based on Maslow's work on human motivation, which covers the individual level of motivation to satisfy their needs. Maslow (1943) proposed five types of needs that have to be satisfied, sequentially: (1) physiological needs (i.e. food, air, water) (2) safety needs (i.e. security, guarantee) (3) belongingness/love needs (i.e. friendship, relationship) (4) self-esteem (i.e. prestige, accomplishment, respect) (5) self-actualization (i.e. creativity, problem solving, and morality). The interlinkage of these types of motivation will be more elaborated in section 5.

3. METHOD

We used a literature review and semi-structured interview to compile data related to the *Pasikola* co-creation process and to analyze stakeholders involved during the process. The literature review aimed to collect information about the context of the case. We collected information about the initiative from both online official documents and documents shared by stakeholders via email. There were six documents reviewed which mostly contained information about technical description, tools used, and stakeholders in the project, and also its process, output, and outcome. Most documents dated between 2016 and 2018 when the project was in progress. Therefore, several updated information on the project (between 2018 and 2019) could not be explored due to governance change in *Pasikola*.

Semi-structured interviews were conducted to collect more detail information about the co-creation process, the challenges faced during the process, the preparation of the process, and a stakeholder perspective on the process and results. We interviewed representatives from the Department of Transportation of Makassar City; a local public transportation organization; the BaKTI Foundation; an elementary school that had participated in the initiative from the beginning; a parent; and students who participated in the initiative. In total, we interviewed seven people with different backgrounds individually, within 30-45 minutes in average. The analysis focused on the process of and stakeholders' involvement during the co-creation of *Pasikola*. The data collected through both literature review and semi-structured interview were analyzed qualitatively by using Atlas.ti software. The analysis focused on the topics of the research questions, namely the co-creation process, involved stakeholders, and success factors. We analyzed the stakeholders further using a power-influence matrix to map and analyze the involved stakeholders and reveal stakeholder dynamics in each phase of the process.

4. RESULT

4.1. *Pasikola* Co-Creation Process

Generally, four program phases can be distinguished and each phase has specific steps in the co-creation process from which *Pasikola* emerged as one of proposed solutions. These phases are: (1) mobility study (2) design workshop (3) incubation period (4) service piloting (see Figure 4). Specifically, there were several preparation activities done prior to or during each phase, such as a meeting and

Figure 4. Program timeline of the co-creation process (Source: Reddy, 2018)

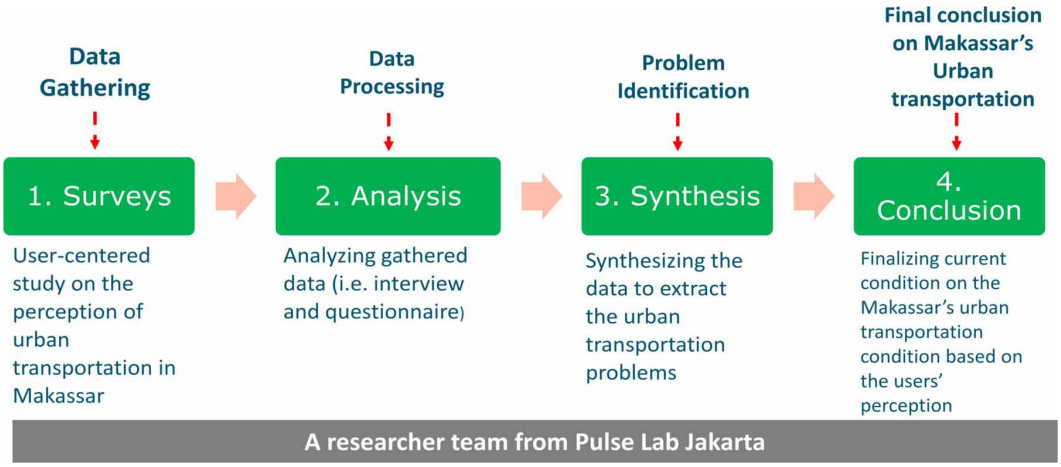
discussion with the Mayor; a mobility study preparation and coordination; a discussion on the study result; preparation of the design workshop; discussion on the result of the design workshop and preparation of the incubation period; service piloting preparation; and evaluation of each piloting step. In this section, we elaborated the general phases first and then supported it with related specific activities which contributed to the phase. We also linked specific steps within each phase to specific elements within the theoretical lenses.

Before the mobility study started, the UNDP BRH met the mayor to ask about urban problems in Makassar that they could help to cope with. The mayor stated that, at that time, traffic congestion was a high priority problem that had to be looked into for solutions. He also appointed the Department of Transportation of Makassar City as the focal point for the program. Based on this directive, UNDP BRH collaborated with Pulse Lab Jakarta to make a baseline assessment regarding Makassar's mobility condition. With several communication and coordination activities with the Department of Transportation of Makassar City, the research team from Pulse Lab Jakarta started the mobility study in September 2016. This starting point is a clear example of a political and administrative element within hard infrastructure approach of collaborative planning.

Using a qualitative approach (a primary survey, in-depth interviews, digital libraries, and an affinity diagram analysis), the researchers collected within six days, insights on mobility needs, habits of and "pain points" for the transportation users, when using both private and public transport (Pulse Lab Jakarta, 2016) (see further explanation on each step in Figure 5). In a report[6] on this study they concluded that most people in Makassar preferred to use their own vehicle rather than to use a public bus, a minibus *(pete-pete)*, or a pedicab. Most of them said that the provided public transports were unreliable, uncomfortable, and unsafe to be used.

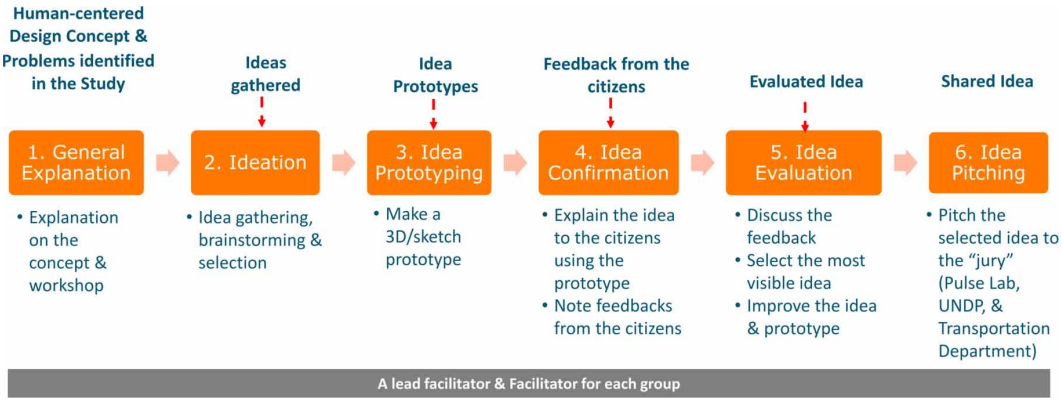
Based on these findings, Pulse Lab Jakarta and UNDP BRH conducted a 1-day workshop with the Department of Transportation of Makassar City and BaKTI to discuss the study insights and missing aspects, and to formulate challenges for a multi-stakeholder workshop (design workshop) as the next phase (Pulse Lab Jakarta, 2016). All these parties agreed on three main challenges, namely

Figure 5. Steps on the mobility study process (based on interview with BaKTI Foundation)



services, behavior, and information of Makassar's urban transportation. In November 2016, a multi-stakeholder workshop, called "design workshop", was conducted with the aim to develop solutions addressing the formulated challenges (see further explanation on each step in Figure 6). The workshop adopted several techniques[7], as follows: design thinking; affinity diagram; focus group discussion;

Figure 6. Steps on design workshop process (based on interview with BaKTI Foundation)



prototyping; field validation; and pitching. The participants were grouped and they had to discuss the issue and solution by writing their notions on a sticky note which was put on a board to be discussed and structured later. Then, the solution was prototyped using the provided materials (i.e. paper card, plastic, wood stick, etcetera) to make their solution more tangible. The prototype was utilized for demonstrating their solutions to the people to validate the solution. At the end, they pitched the final solution to a jury to be assessed for further development.

There were preparations made before, during, and after the design workshop (see Figure 7). Before the design workshop, the UNDP BRH appointed a lead facilitator from Pulse Lab Jakarta and communicated with a local NGO (BaKTI) to fully assist the program by giving them direct funding and consultants to guide them (from Pulse Lab Jakarta). BaKTI prepared several logistical matters

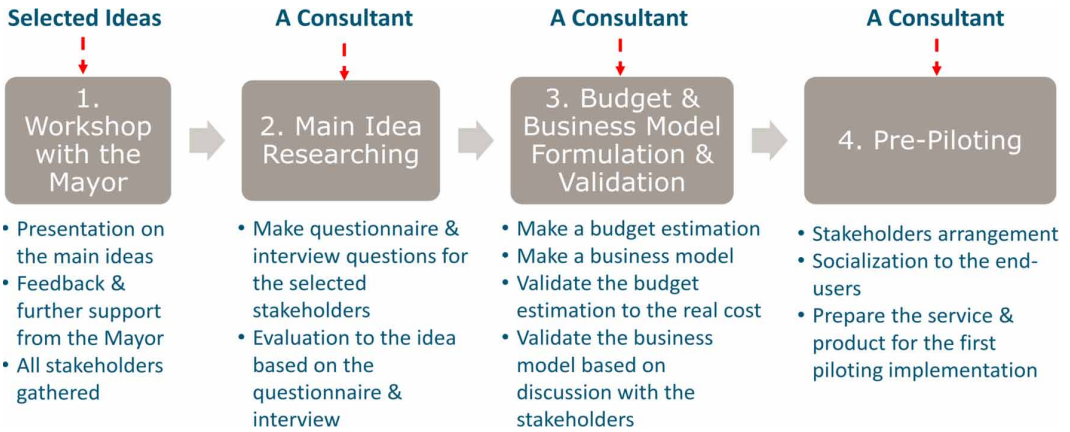
Figure 7. "Behind the Scene" of the design workshop phase (based on interviews with the BaKTI Foundation)

for the design workshop, mapped participants that were invited to the workshop (appointing potential participants based on BaKTI's insight), advocated the Mayor through the Transportation Agency, and provided facilities (venue) and co-facilitators. They also ensured that the invited participants attend the workshop by phoning each of them. In that perspective, the Mayor also contributed to convince the key participants to attend the workshop. The invited participants were from different sectors, such as creative communities, schoolteachers, police officers, government representatives, digital startup, media, local NGO's, and local banks.

Before the start of the workshop, a preparation meeting was held to arrange technical things for the workshop, such as group arrangements, co-facilitators coaching, and coordination on the logistics. The meeting was attended by several representatives from the Transportation Agency, the UNDP, BaKTI, and Pulse Lab Jakarta, as initiators. During the 3-day design workshop, the lead facilitator became the key person in maintaining participants to follow every step in the workshop without losing their mood and spirit. He treated all the participants equally as all the participants had to hide their professional background. He ensured that each group was not stuck during discussion sessions by giving them more explanations. As a result of the workshop, six ideas emerged, namely "Makassar for All"; "HaTe - Halte Pete Pete' (*Pete-Pete Terminal*)"; "*Pasikola*"; "Ayo Berubah SMART!"; "Bajikia"; and "e-Nassami". After the pitching session, only three ideas were selected by the jury, namely "*Pasikola*"; "e-Nassami"; and "Bajikia". The "e-Nassami" proposal contained a mobile application to show a real time schedule of the bus rapid transit in the city. "Bajikia" was a local bus feeder for a remote area in the peripheral area of the city which also utilized a mobile application as a tool for updating the bus schedule information. After the workshop, the initiators arranged for the next phase, which was the incubation period. In that phase, the participants were given technical assistance to shape their ideas into a "ready-to-pilot" service or product (Pulse Lab Jakarta, 2016).

Two months later, February 2017, the incubation period for the emerged ideas was conducted (see further explanation on each step in Figure 8). The incubation period was opened by the Mayor with a kick-off session attended by the initiators and several participants of the selected ideas. At the beginning of the incubation period, the "Bajikia" team resigned from the program and then

Figure 8. Steps in incubation phase (based on interviews with BaKTI Foundation)



the "e-Nassami" team joined the "*Pasikola*" team to develop "*Pasikola*" together. Then the mobile application idea from "e-Nassami" was modified to support the performance of "*Pasikola*". Therefore, there was only one idea left to be further explored in the incubation phase. Finally, the incubation team consisted of two people from BaKTI; one person from the IT community; and one person from the government institution. They could easily organize any group dynamic that emerged during the incubation period because they had interacted with each other.

The incubation phase was conducted in two months (February - March 2017) at the BaKTI office, as a base camp for the team. A consultant was hired by UNDP BRH to guide the team in each step of the incubation period. The team was coordinated by the consultant through face-to-face meetings for two weeks and via E-mail, WhatsApp group, and Skype meeting. The consultant developed a comprehensive agenda for the incubation period, together with the team. At every step, the consultant gave explanations, directions, suggestions, targets, and a timeline to do specific works in the incubation phase. The consultant also gave the team a tight deadline for arranging several things needed for "*Pasikola*" to be ready for implementation in the pilot phase, such as a field survey, a business model and a budget formulation, and piloting preparation. In this phase, all the participants were given budget for local transportation. The most important point is that the consultant empowered the team to work together based on the program schedule that was arranged together by them.

A pilot project preparation was created as a bridging step from the incubation phase to the pilot project. In April 2017, the team performed the following activities to make the "*Pasikola*" concept ready to be implemented: (1) looking for an owner of *pete-pete* to join the *Pasikola* initiative; (2) preparing the *pete-pete* for *Pasikola* in a garage; (3) communicating with a school to join *Pasikola* and then selecting students willing to join; (4) communicating with parents on the agreement in using "*Pasikola*" and informing the parents on how to use *Pasikola* Apps to monitor their child/children while in the fleet; (5) discussing the most effective route for the *Pasikola* vehicle together with the parents and school representatives; and (6) coaching the *Pasikola* driver on how to drive safely and use *Pasikola* Apps using a formalized Standard Operation Procedure (SOP).

After all the required preparations were done, between May 2017 and March 2018, the "*Pasikola*" team conducted a pilot implementation of their service. In that timeframe, the piloting phase was divided into five sessions, 1.1 until 1.5. In the piloting phase, the team did iterative improvements for a better operation based on user's experiences. The improvements in the piloting phase included: improving facilities inside the vehicle (i.e. a water gallon and mini library), improving vehicle safety (i.e. adding window trellis and a safer vehicle door), rearranging seats (based on the student's perspective), and improving SOP for the driver in accompanying the students to and from school.

During this piloting phase, services given to the students were free of charge. A collaborative financing structure between UNDP BRH and Makassar municipality was set up to pay for human resources (*Pasikola* team and drivers), vehicle modifications and improvements, gasoline, socialization to schools and parents, and application developments. Figure 9 shows the result of the piloting process.

Based on the piloting phase (2017-2018), the impact of *Pasikola* can be seen related to several aspects. There were 103 students from seven schools (elementary and junior high school) who used the service. Reddy (2018) stated that, covering seven schools using ten *Pasikola* shuttle cars, there was a reduction in the number of private vehicles used by the parents up to 80%. This implicates to the reduction of the total vehicles that come to the schools in the morning and afternoon and reduction of congestion on roads around the schools. It also has implications on the time saved by the parents up to two hours/day (one hour each to drop-off and pick-up their child to and from the school). Therefore, *Pasikola* not only benefits the traffic of the city but also socially benefits parents and schools.

4.2. Stakeholder Interaction in the *Pasikola* Co-Creation Process

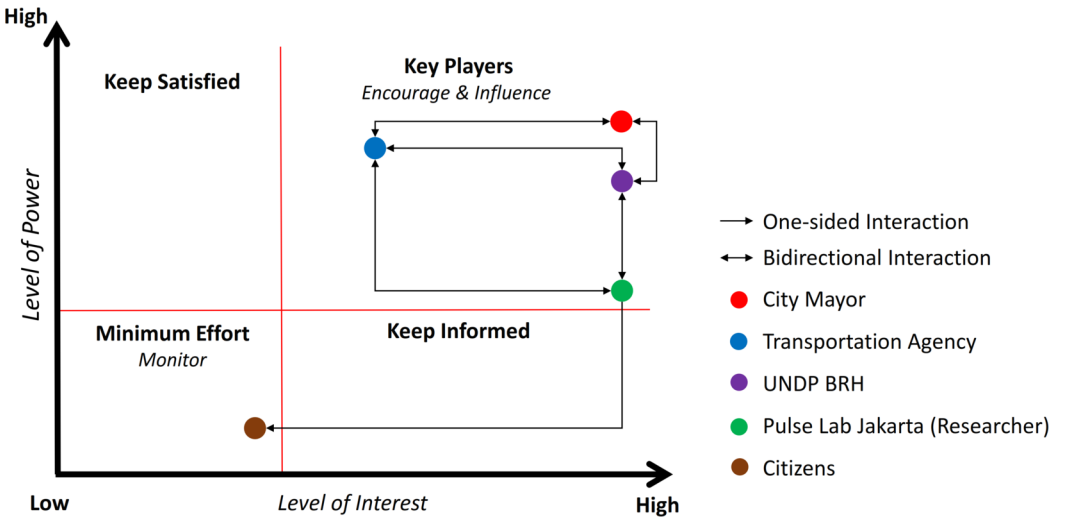
Several stakeholder interactions occurred during each phase in the process. These are represented in a stakeholder analysis of each phase. Regarding the interaction process, there are one-sided and bidirectional interactions. A one-sided interaction refers to a one-direction communication from one actor to another. A bidirectional interaction refers to a two-direction communication as a dialogue between actors.

Regarding the stakeholder interaction in the first phase, the mobility study, it can be identified as a bidirectional interaction; the UNDP proposed the program to the Mayor and then the Mayor responded to their proposal by giving permission, a directive, and appointing the head of Transportation Agency of Makassar City as the responsible department for this program to follow the process and to help UNDP carry out the process. The head, then, reported to the Mayor about the progress. The agency discussed the plan with UNDP and helped them execute the plan. UNDP gave their study and

Figure 9. Infographics on *Pasikola* piloting phases (Source: Reddy, 2018)

other reports to the Agency. Furthermore, UNDP appointed Pulse Lab to conduct the study. Then Pulse Lab reported regarding the progress and results of the mobility study to UNDP. In a one-sided interaction, Pulse Lab as the researcher observed and interviewed citizens to gather information. The citizens were only an object of the research in this phase, therefore they had no impact on the process. See Figure 10 for the stakeholder analysis scheme.

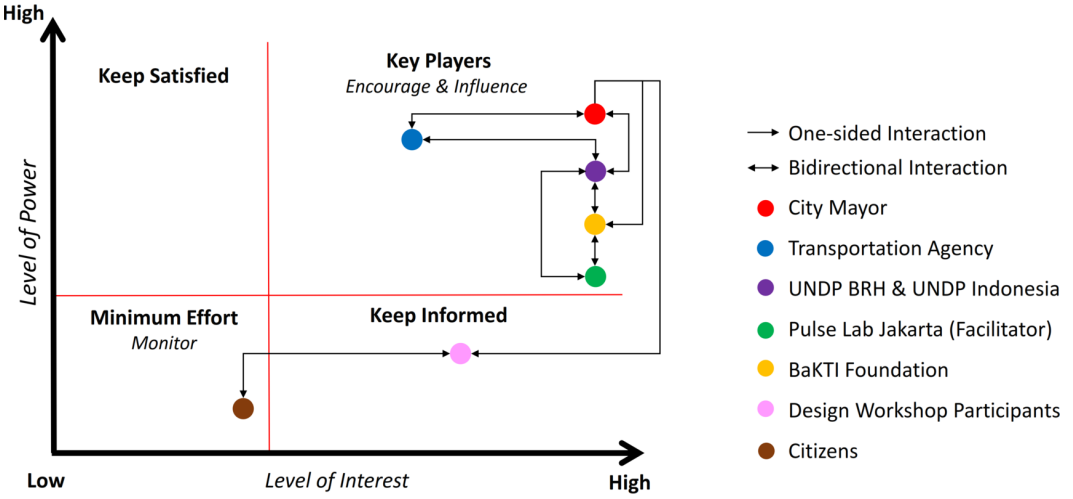
Figure 10. Stakeholder analysis in the mobility study phase



Regarding the stakeholder interaction in the second phase, the design workshop, in the one-sided interaction, the Mayor himself invited the design workshop stakeholders and convinced several of them to join the workshop. He also directly communicated with BaKTI for any arrangements related to the program. UNDP appointed BaKTI as a local facilitator and organizer for the program and then BaKTI coordinated with UNDP on the process and reported on it. UNDP also gave seed funding to BaKTI to operationalize the program. UNDP appointed Pulse lab to be a facilitator for the design workshop. Then Pulse Lab reported regarding the progress of the design workshop to UNDP. The design workshop participants interacted with citizens in the idea validation step during the workshop by presenting them the developed idea and then gathering their views on this idea. In all the activities during this phase, the Transportation Agency always interacted with the UNDP and Mayor. Several of the agency's staffs also became the workshop participants. See Figure 11 for the stakeholder analysis scheme during the design workshop phase.

Regarding the stakeholder interaction in the third phase, the incubation period, all the interactions can be identified as bidirectional. The City Mayor was working closely with the Transportation Agency, UNDP, and BaKTI Foundation. He gave a presentation during the incubation kick-off on the generated solutions and other stakeholders gave suggestions to him. BaKTI Foundation as the local organizer always reported the progress to UNDP, Transportation Agency, and directly to the Mayor. Each of the institution gave BaKTI several feedbacks towards the process. In this phase, the Transportation Agency got more interest as the solution started to be realistic. UNDP hired Pulse lab to be a consultant during the incubation period to assist the incubation team. Then Pulse Lab reported regarding the progress of the incubation period to UNDP. The incubation team worked closely with Pulse Lab and BaKTI during the incubation period to further explore the idea selected from the design workshop and operationalize it. As *Pasikola* was selected for further development,

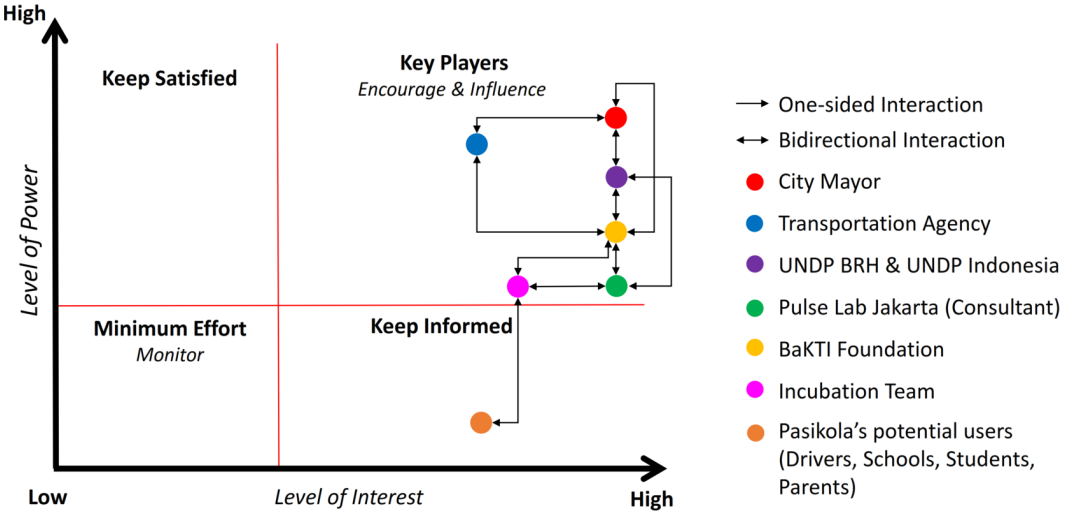
Figure 11. Stakeholder analysis in design workshop phase



during the process, the incubation team conducted several surveys (using questionnaires), interviews, and discussions with *Pasikola*'s potential users. The potential users also gave several feedbacks for the incubation team. See Figure 12 for the related stakeholder analysis scheme.

Regarding the stakeholder interaction in the fourth phase, piloting, all the interactions can be identified as bidirectional. The City Mayor was still working closely with the Transportation

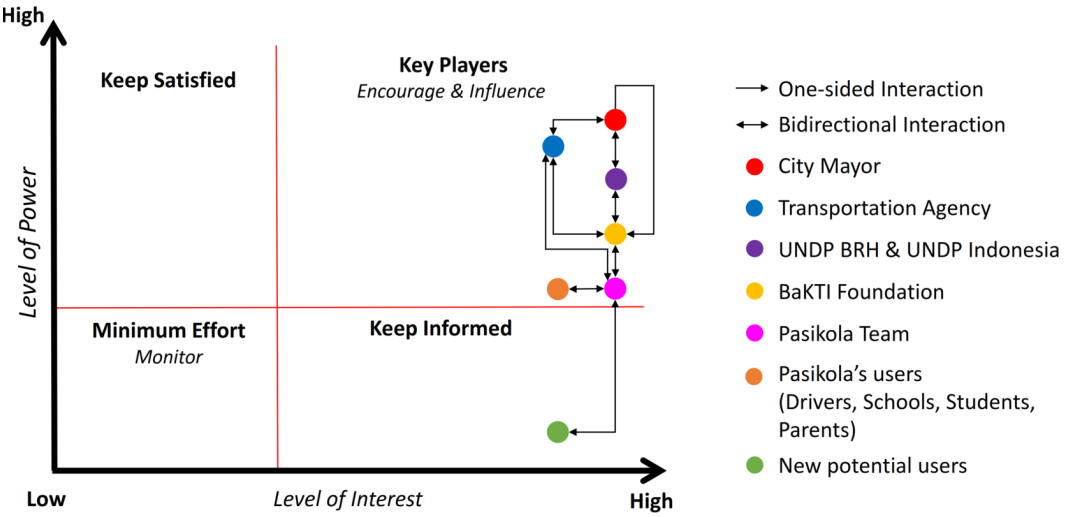
Figure 12. Stakeholder analysis in incubation period phase



Agency, UNDP, and BaKTI Foundation. He was opening the piloting phase and giving endorsement for *Pasikola*. BaKTI Foundation still reported the progress to UNDP, Transportation Agency, and directly to the Mayor. Each of the institution gave BaKTI several feedbacks towards the process. The Transportation Agency got more interest in *Pasikola* as the idea became more tangible and could be operationalized. In this phase, resources from Pulse Lab were no longer needed. Therefore, the

Pasikola team was in charge of the technical aspects of the solution. The *Pasikola* team worked closely with BaKTI during this phase to operationalize and improve the solution. The team also conducted several field surveys, interviews, and discussions with *Pasikola* users for any improvement suggestions. The users gave several feedbacks to the team. See Figure 13 for the stakeholder analysis scheme of this phase.

Figure 13. Stakeholder analysis in piloting phase



Reflecting on the stakeholder analysis result, we observed that the stakeholders involved in the process have different levels of power based on their institution profile. At the beginning the program was designed to be implemented by cooperating with the Municipality, progress related to the program had to be always reported to the Municipality, in this case the Mayor and Transportation Agency (the political and administrative structure). In Indonesia, the Municipality has a full authority to control any programs related to them, including the co-creation process which resulted in *Pasikola*. Therefore, the stakeholders, like UNDP and BaKTI Foundation, had to inform the Mayor and Transportation Agency all the time. The Mayor and Transportation Agency could intervene in the process at any phase because the program was conducted in their administrative area (this relates to the administrative structure and legal process during the co-creation process). Therefore, Municipal institutions have the highest power in this process. UNDP BRH and UNDP Indonesia are the third powerful group because they made the program concept (the whole idea) and had the networks as well as funding. This reveals that the Municipality and UNDP needed each other to operationalize the program in Makassar City. However, the biggest power is still at the Municipality side. In addition, as UNDP BRH chose BaKTI as a local NGO to coordinate and organize the program, this foundation is the fourth powerful stakeholder. The foundation had a crucial role in bridging the UNDP with local stakeholders in implementing the whole program. Pulse Lab can be seen as the lowest powerful stakeholder because they only supported UNDP and BaKTI in conducting a mobility study, facilitating the design workshop, and being a consultant in the incubation period. Later, the role of Pulse Lab was no longer needed and replaced with the *Pasikola* team that conducted any technical aspects of the solution. Therefore, there are five stakeholders who can be identified as the key players who play a role to encourage and influence the program.

4.3. Success Factors of the *Pasikola* Co-Creation Process

Based on the phases and stakeholder interactions in the co-creation process, we revealed five important factors which contribute to the success of the process, namely (1) back up from the Mayor (2) various stakeholder involvement (3) local NGO facilitation (4) international NGO facilitation and (5) a committed team. First, the backup from the Mayor was necessary to gain local political and institutional support which contributed to the successful conduction of the mobility study, stakeholder engagement, result legitimation, and legalized processes. As a local leader, the Mayor could influence key stakeholders to participate in the process and at last, as a result of the co-creation process, the *Pasikola* project could be legitimated by formalizing through a Mayor's decree. At the end of piloting step 1.5 (March 2018), the Mayor issued a decree regulating several aspects, such as the *Pasikola* service pre-requirement; the partnership agreement between *Pasikola* and selected schools and drivers; a driver recruitment and training procedure; the vehicle provision, recruitment, and modification procedure; the route determination; the service funding source and payment; the evaluation and monitoring; and at last an administrative sanction.

Second, various stakeholders[8] involvement, a hired professional facilitator, and experienced group facilitators in the process influenced the emergence of innovative ideas. As a result, the emerged innovative idea could be implemented by collaboration among the stakeholders. It could increase awareness among the stakeholders and the result could become a common idea, not just a single person's/group's idea.

Third, the local NGO Facilitation (the BaKTI Foundation) contributed their resources (human resources, facilities, networks) to make the process successful (from initiation to piloting) by organizing stakeholders, becoming a facilitator and offering a shared knowledge platform, behaving as an intermediary actor to bridge the stakeholders with the Mayor and UNDP BRH. All these elements also contributed to the continuity of the *Pasikola* implementation.

Fourth, the international NGO Facilitation (the UNDP BRH, UNDP Indonesia, and Pulse Lab Jakarta) contributed with several key resources to initiate the process. UNDP BRH contributed seed funding and together with UNDP Indonesia, they arranged the process by allocating their human resources to the process and used their network to hire facilitators, consultants, and the local NGO. Pulse Lab Jakarta, hired by UNDP BRH, also contributed to the execution of the mobility study, facilitation of the design workshop, consultation during the incubation period, and publication of reports related to the process for knowledge sharing. The international NGOs also offered the local government, NGO, and stakeholders capacity building by implementing a co-creation approach in Makassar City, which is not a common approach for a local government in Indonesia. It also revealed that program initiation from an international NGO offers opportunities for local actors to gather new knowledge, skills, and experiences in coping with urban challenges.

Last, a committed team to develop and implement the idea of *Pasikola* was important because it influenced the continuity of the *Pasikola* initiative in the future. Any institutional transition has to be done carefully to ensure that a new team to manage *Pasikola* has, at least, similar performance to the previous team.

These five factors seem to relate to the governance aspect in solving urban problems. It seems that governance is an essential aspect to be developed and maintained by stakeholders to implement a co-creation process successfully.

5. DISCUSSION

During the co-creation process of *Pasikola*, several elements of the co-creation framework (Figure 3) and collaborative planning concept (Table 1) could be identified. Additionally, we found that the process is related to a top-down approach and a co-creation approach. At the beginning of the process, the UNDP BRH engagement with the Municipality can be categorized as both hard infrastructure and soft infrastructure elements (see also Table 1). The hard infrastructure elements

led to a political structure (engagement with the Mayor), an administrative structure (engagement with the Transportation Agency), and a legal process (legal cooperation between UNDP BRH and the Municipality) and can be identified as a top-down approach, needed to start the co-creation process. Within the soft infrastructure, we identified that the relation building is represented by the cooperation between UNDP BRH and the Municipality.

We cannot position the mobility study phase in the co-creation framework by Oertzen et al. (2018). It seems that there might be a process prior to the co-ideation step aiming to unpack challenges that would be solved through the co-ideation process. The next phase, the design workshop, is a combination of the co-ideation and co-valuation steps which represents a regenerative process of the co-creation process. Involvement, engagement, and participation of various stakeholders led to the utilization of soft infrastructure elements, which are relation building, consensus building, and social learning. During this phase, a co-creation approach was revealed in which stakeholders were given the issues and steps to be taken, while they only had to generate ideas to solve the issue. A top-down approach with hard infrastructure elements (political and administrative structure) was also visible with the Mayors' direction to several invited stakeholders to come to the workshop; the selection of the invited stakeholders by UNDP, Transportation Agency, and BaKTI Foundation; and the selection of ideas by the jury.

The incubation phase is a combination of co-valuation, co-design, and co-test steps. A regenerative process, which led to an operative co-creation, seems to take part here. In this phase, all the soft infrastructure elements were still utilized. During this phase, a more co-creation approach was adopted in which solutions were explored by the incubation team. However, in the participatory process, a top-down approach with a hard infrastructure element (political structure) could be identified with the Mayors' direction to the incubation team at the kick-off event and the consultant's direction on the method that should be used by the team.

The piloting phase contains a combination of co-design, co-test, co-launch, and co-production steps. A more operative co-creation took part here. In this phase, a combination of soft and hard infrastructure elements took place. The soft infrastructure elements seem to appear more in the *Pasikola* team who always built consensus and learnt socially both among team members and *Pasikola* users. The hard infrastructure elements seem to appear more in the governance aspect during the operationalization of *Pasikola* which relied on the political power of the Mayor, the administrative authority of the Transportation Agency, and the legal process that had to be taken care of among *Pasikola* team and the users. During this phase, a co-creation approach was adopted in which the solution was iterated collaboratively with the users until it met the most optimal, acceptable, and stable condition. A top-down approach with a hard infrastructure element (political structure) could also be identified as the *Pasikola* team needed the Mayor to communicate with all potential users (public transport organization, drivers, schools, students, and parents).

After the piloting phase we saw that co-production and co-consumption steps can be identified in the implementation of *Pasikola* as from 2018 until now, it has been a small business with legal matters under the Transportation Agency authority. Students are now charged for using this service.

We saw that a further discussion on the interaction between top-down policy and a co-creation approach is needed to have a deeper understanding on the utilization of the interaction in solving urban challenges effectively. At the end, we also included a notion about stakeholder motivation in the co-creation process.

5.1. Co-Creation as an Alternative Approach in Solving Urban Challenge

A co-creation process in the *Pasikola* project represents a participatory approach with a collaborative planning process, covering both soft and hard infrastructure elements. Regarding the soft infrastructure, various stakeholders could noticeably work together during the design workshop, the incubation period, and the piloting phase, offering solutions for a specific urban issue. The "work together" aspect covers elements within the soft infrastructure, namely relation building, consensus building,

and social learning. Conceptual solutions produced by the stakeholders themselves and shared with others could be nicely done via the phases. Every stakeholder has room for learning from each other, sharing information, brainstorming, and identifying potential resources which could not take place when applying a fully top-down approach like most governments do (Voorberg et al., 2017). Regarding the hard infrastructure, both governmental and non-governmental stakeholders work together, backed up by the political power from the Mayor. The formal political power in governmental bodies has a positive impact on the solution development and implementation. The effects are likely to have governmental support for the process, policy support for the solution, and authority support in socializing and applying the solution within the city. Therefore, it also represents the administrative structure and legal processes, which are involved in the policy-making process for a solution.

However, there is a low contribution through a co-creation approach to the interlinkage and coherence between the generated ideas from the process and the government's policy or program. The idea exploration and development seem uncertain and the implementation is flexible, based on iterative discussions, improvements, and field tests. Additionally, the impact for a solution emerging from a co-creation process is, at first, small and there will be a longer way to go to see a tangible impact from it; yet a small impact can efficiently solve the selected problem as the executors only focus on a small scale area, therefore all resources could be combined.

On the other hand, in a fully top-down approach, the non-governmental stakeholders could only contribute through a limited coordination meeting and discussion, aiming to formalize a governmental policy or program for the city and share their resources for the program (i.e. funding, networks, knowledge, experiences, and information). The policy or program as a solution for the city's issue is formalized by the government through the hard infrastructure elements without offering any options to the non-governmental stakeholders to propose their ideas and implement it together. This approach has a low contribution on the innovation principle which is one of the core elements of the co-creation approach. Most governmental programs are usually developed in a technocratic and political way (Blomkamp, Sholikin, Nursyamsi, Lewis, & Toumbourou, 2017) whereas there is a huge "power-distance"[9]in Indonesian bureaucracy context (for further explanation see Hofstede, 2011). In this governmental organization culture, we cannot expect innovation to develop within the governmental bodies and work together with the non-governmental sectors in a program aiming to solve a city's issue.

5.2. Proposing an Effective Approach: Strategic Top-Down Policy With a (Participatory) Co-Creation Approach

Both the top-down approach and the co-creation approach have their strengths and weaknesses, but both bring benefits for solving a city issue. It seems better if both approaches are combined in a problem solving process of a city. The top-down approach could be represented through a more strategic than comprehensive plan, meaning that the government only formulates an ultimate goal, prioritizes their issue and indicators related to the ultimate goal, and sets ambitions for solving each issue and achieving each indicator. For instance, if the government has a goal to be a zero congestion city, they might prioritize private vehicle reduction as an issue which has to be solved first, then set ambitions for solving it by having some kind of "public transportation revitalization" within a certain timeframe. The government could also make a timeline, offer an indicative budget, and describe required actions to satisfy the ambitions (for reference on a strategic top-down approach see Amsterdam Municipality, 2009; 2015; 2016).

In the co-creation approach, a stakeholder could examine a strategic plan to have it interlinked and cohered with the government's strategy on solving a city problem. A non-governmental stakeholder could refer to the governmental goal and program, or the ambitions (if the government has made a strategic plan) in selecting a city issue because this can be the first step to ensure that the generated idea is aligned with the government's goal and program. It could also lead to a (small) adjustment of the strategic plan after specific findings.

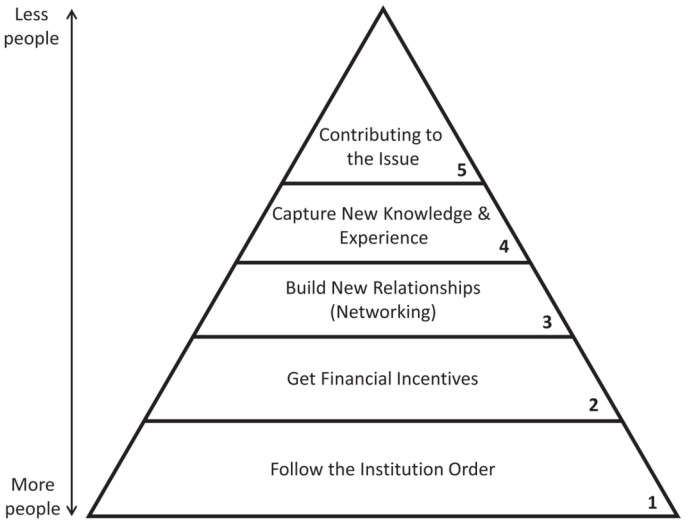
However, whether a process uses a fully top-down, participatory, or combination of both approaches, it is important to always engage a local political leader (e.g. the City Mayor) in this process because he/she has the most power and interest in the process. With a backup from a local political leader, the process will likely be smoother, more successful, and improved continuity. It illustrates that a project needs a hard infrastructure element. Additionally, a solution generated from the process could be legitimated by the Mayor more quickly because he/she is already familiar about the process and solution. However, taken the power-interest dynamics between stakeholders into consideration, it is difficult to make an equal power among stakeholders within a co-creation process (Farr, 2018). To mitigate the power dynamics within the co-creation process, there are at least two efforts to be done. First, it is necessary to always have a critical and reflective dialogue during the process to empower people and reduce power domination (Farr, 2018). Second, it is also necessary to encourage a transparent result reporting and shared decision on every important aspect in each step (Davis and Andrew, 2017)

Also the moderator or facilitator role seems important to support the soft infrastructure elements, linking relation building and coming to consensus within the project. The combination of both approaches with the utilization of digital means, either during the process or for the implemented solution, could be a new way to plan and manage a contemporary (Indonesian) city. The type of digital means that could be utilized during the process is related to communication and coordination, such as e-mail, WhatsApp, and skype. Digital technology, which is usually useful to support a co-creation solution, is an online application (i.e. website, mobile application, and software).

5.3. Stakeholders' Motivation: Important Attribute for a Successful Co-Creation Process

Based on the stakeholder analysis result, we tried to formulate a stakeholder level of motivation in participating in a process (see Figure 14). Best, Moffett, & McAdam, (2019) showed that stakeholder salience is a key resource in a co-creation approach. By understanding the stakeholder salience, which leads to their interests (motivation), it could make the outcome of a co-creation process more valuable, impactful, and effective (Best et al., 2019). Additionally, Pera, Occhiocupo, & Clarke (2016) stated that there is a specific motivation input from each stakeholder in participating in a co-creation process, such as reputation enhancement, experimentation, and relation building. Therefore,

Figure 14. Stakeholder level of motivation in co-creation process (Source: Developed from Pedrosa, 2009)



it reveals that there is a significant influence on the motivation of each stakeholder as participant in a co-creation process. Furthermore, referring to the motivation concept elaborated in section 2, the stakeholder level of motivation is based on intrinsic and extrinsic motivations. This will be presented in the stakeholder level of motivation.

The formulated level of motivation was enriched by a study of Pedrosa (2009) on people motivation in co-creation process. To present the level of people's motivation on getting their needs, we made a pyramid-like scheme (see Figure 14). The stakeholder level of motivation in the co-creation process also seems to be aligned with the hierarchy of needs by Maslow (1943), but it is represented at a different scale (a communal and individual one). The interlinkage between Maslow's diagram and this stakeholder level of motivation is that the stakeholder motivation is found in belongingness and love, self-esteem, and self-actualization needs. By meeting people, the participants made friends with each other (belongingness) and respected each other while they tried to finish every step of the process (self-esteem). Along with the process, they exposed their creativity, problem solving skill, and acceptance of others' arguments (self-actualization). That could take place in every level of stakeholder motivation.

In this motivation pyramid, we can observe that the higher the level of motivation, the less people are motivated for the process. We can also see that more people have an extrinsic motivation (from level 1 to 3), while fewer people have an intrinsic motivation (at level 4 and 5). At the first level, most stakeholders participate because they just follow orders from their institutions. As an initiator sends out an invitation letter for all stakeholders to attend to a design workshop, institutions which receive the invitation usually delegate their staff to attend the workshop and report to their boss. It is evident from an interview with BaKTI Foundation, that there were several people from government institutions, NGOs, and private sector who attended the workshop just because their boss asked them to come. The interview also revealed that several people from a local public transport institution and media were willing to attend the workshop just because they were asked by the Mayor. This low motivation made the delegation to just be present and attend the workshop without any sincerity to contribute something useful. However, people at this level can be more motivated if given interesting material and potential benefits either for themselves or their institutions, thus they will move to a higher level, yet there is no guarantee that they will get directly to the top level. In fact, most of the people participating in the workshop had this (low) motivation, including those from the governmental sector.

At the second level, there are several persons who not only follow their institution order, but also are aware that they will be paid for participating in the workshop. A financial incentive was not only offered from the committee of the workshop but also from their institution (i.e. transport cost). In the design workshop invitation, it was stated that the participants would get remuneration if they attended the workshop, so they could be aware of it. The initiator can act strategically by giving the money on the last day of the workshop.

At the third level, the motivation is not about order and money anymore, but about building relations with new people during the workshop. As this was a multi-stakeholder workshop, this was the best opportunity for a participant to approach someone from other institutions or communities to just either make a new friend or communicate about personal or institutional business.

Capturing new knowledge and experience at the fourth level is considered a more valuable motif because once the participants are interested in the knowledge emerging from the workshop, they are more likely to contribute to the issue. Additionally, particular experiences that they gather help them dive deeper into the issue and contribute more during brainstorming sessions.

The top level contains people who have high motivation to cope with an issue and bring creative solutions for it. It means that those people are still motivated even if they are not ordered by their institution, not paid for their participation, and not motivated in making new relations. They will always be curious about every knowledge that they can gather in each step and are progressive in every discussion. Unfortunately, there are only few people who have such motivation during a workshop session. The initiator could select these people to contribute in the next phases, namely

incubation period and pilot project, because they will act no matter what the condition is and have a high motivation to solve an issue.

6. CONCLUSION

Studying the co-creation process of *Pasikola*, the Indonesian government could learn that a concrete action to cope with an urban problem can be conducted by combining a top-down approach with a co-creation approach. A co-creation process provides room for collaboration among various stakeholders, in which it enables them to share their knowledge, build relation and consensus, and learn from each other. However, it takes time to develop and implement a solution and see a tangible impact from it. Yet a small impact within the described case efficiently solved the selected problem as the executors only focus on a small-scale area, therefore all resources could be brought together. It also has a low contribution to the interlinkages and coherence to the government's agenda as the implementation of the selected solution is uncertain and flexible which is based on iterative discussions, improvements, and field tests. On the other hand, a fully top-down approach has a low contribution in terms of the innovation principle. Most government's programs are usually developed in a technocratic and political way which offers limited space for innovation and working together with non-governmental sectors.

Collaboration between the top-down approach and co-creation approach gives an opportunity for a more effective and impactful urban solution implementation. In the top-down approach, the government's plan could be more strategic. The government has to only formulate an ultimate goal and set ambitions for achieving the goal. They could also set up a timeline, offer an indicative budget, and describe required actions to satisfy the ambitions. In the co-creation approach, stakeholders could examine the government's strategic plan, so that it will interlink and cohere with the goals and government's strategy on managing their city. The non-governmental stakeholder could refer to the government goal and program, or the ambitions (if the government has made a strategic plan) in selecting an urban issue to ensure that the generated idea would be aligned with the government's goal and program. A formulation of the used indicator is also necessary to measure the impact of the solution. The combination of both approaches with the utilization of digital means, either during the process or for the implemented solution, could be a new way to plan and manage a contemporary (Indonesian) city. The type of digital means than could be utilized during the process is related to communication and coordination, such as e-mail, WhatsApp, and skype. Digital technology which is usually useful to support a co-creation solution is an online application (i.e. website, mobile application, and software).

Related to the stakeholder engagement and success factor of a co-creation process, the higher the level of motivation, the fewer the people motivated for the process. It also shows that a local political leader is important to be engaged as he/she has the most power for the process. He/she could back up the process and legitimate a solution generated from the process. This study revealed five important factors contributing to the success of a co-creation process, namely back up from the Mayor, a various stakeholder involvement, local NGO facilitation, international NGO facilitation, and a committed team.

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ENDNOTES

1 City-I-LEAPS (City Innovation through Learning, Exchanging, Adapting, Prototyping and Scaling) is a joint initiative of UNDP BRH and the Seoul Metropolitan Government to facilitate ideas of various stakeholders to develop solutions that meet social needs using a citizen engagement approach. It was also done in other cities outside Indonesia.

2 E-oriented techniques refer to any utilization of digital means both during the co-creation process and for the generated solution.

3 Arnstein (1969) proposed a notion that explains different rung level of participation which formulize three kinds of participation, namely non-participation (manipulation and therapy); degrees of tokenism (informing, consultation, and placation); degrees of citizen participation (partnership, delegated power, and citizen control).

4 Friedmann (1973) proposed a notion that explains the importance of dialogue between planner and citizen affected by a planning project which emphasizes on interaction between the two actors through intensive communications.

5 Healey (1997) proposed a notion that explains the different elements of collaboration, namely soft infrastructure and hard infrastructure. It emphasizes on the utilization of government's and citizen's resources in planning a project collaboratively through communication, knowledge sharing, and collective intelligence.

6 Pulse Lab Jakarta wrote their findings on the Makassar mobility study in a report called "Makassar Mobility Project: Study Main Findings" in 2016 which covers baseline assessment of Makassar transportation condition, main challenges which have to be solved, and preparation on the design workshop.

7 Pulse Lab Jakarta wrote the design workshop (co-creation process) techniques in a report called "Navigating the Terrain: A Toolkit for Conceptualizing Service Design Projects" in 2017 which covers several techniques used during the co-creation process of *Pasikola* and can be inspirations for co-designers in replicating the approach.

8 The stakeholders include governmental bodies of Makassar Municipality; schools; police; local public transportation business organizations; public transportation users; local NGO; local media; private sectors; creative communities; experts/academics from local universities; local start-ups

9 Power-distance is "the extent to which less powerful members of organizations and institutions accept and expect that power is distributed unequally" (Hofstede, 2011, p. 9).

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