

# Design in Socio-technical Perspective: An Actor-Network Theory Reflection on Community Project 'Kampung Kreatif' in Bandung

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## Abstract

**Background** Concern with the social dimension emerges when design is seen as an interactive process beyond activities to result in products. Actually, design is socio-technical process: designers use and result technical objects when they interact with others. The term 'socio-technical' is derived from Actor-Network Theory (ANT) to describe the mutual relations between human and technical objects. This study was conducted to understand design in a socio-technical perspective by reflecting a design work of 'creative alley' in Kampung Kreatif as project case.

**Methods** This paper is written using the ANT as theoretical based for design reflection to extract knowledge from project case, by tracing the designers activities in society and following actors' relationship in each project stages.

**Results** This paper delivers three arguments: first, collectively design process can be described by unravelling actors and technical objects relationship, focusing how human actors create 'scripts' as a set of ideas, texts, procedures, and technical objects; second: ANT support to account the construction of place by accounting technical objects installed as delegation of human actors; and third, design is a kind of 'pre-prescription' activities: everybody acts as designers collectively when she/he imagining results and developing values before creating 'scripts', where the professional designers roles are determined by design devices.

**Conclusions** ANT is capable of providing a framework for unraveling the complexity of design practice and place-making. Further, it is possible to exercise ANT to support participation and to transform design into socio-technical change by clarifying matters of concern.

**Keywords** Socio-technical Design, Actor-Network Theory, Kampung Kreatif Bandung, Design Reflection

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## 1. Introduction

Concern with the social dimension in design emerges when design is seen as an interactive process beyond activities that result in products (Dilnot, 1982). While working, designers interact with many groups of people, who bring their own knowledge, perspectives, expectations, and ambitions (Dorst, 2003). Social dimension is important when design becomes a discipline concerned with the appropriateness of the result, which is gained through interactions and negotiations between the actors involved (Archer, 1979).

Actually, design is socio-technical process, because designers use technical objects when they interact with other actors, and also mostly resulting a set of technical objects called built environment, such as products, interiors, buildings, or other elements (Batuska, 2007). The term 'socio-technical' is derived from actor-network theory (ANT), a branch of Science and Technology Studies (STS), where the word 'social' is used to describe the mutual relations between human and non-human actors, or using other terms, the relations between actors and artefacts or technical objects (Latour, 1999). ANT studies focus on the relations that occur in the actors' work. In studying design, ANT focuses on 'design in the making', by unravelling the connections between designers, users, products and other actors and technical objects (Yeneva, 2009).

This study was conducted to understand design in a socio-technical perspective, utilizing ANT as the theoretical base for reflection on a design work. Using the ANT approach, this study describes the design process by identifying the actors and technical objects involved in each stage. ANT conducts design reflection on a theoretical level in order to extract knowledge explicitly and academically.

The project case used in this research was the installation of a 'creative alley' in Kampung Kreatif Dago Pojok Bandung as a part of a university community service program in 2013. 'Kampung Kreatif' is an Indonesian term that expresses how residents of urban informal settlements –called kampung – can generate creative activities. Kampung Dago Pojok is a well-known grassroots movement for urban social change in Bandung that uses the label 'creative community'. At the time, there were several community movements in Bandung to declare Bandung a creative city, later inspiring other cities in Indonesia to formulate creative city policies (Fahmi et al., 2015, Kim, 2017).

The main contribution of this paper in terms of knowledge development is to trace the design process in detail. In ontological level, ANT will help to make design network visible (Storni, 2015). By unravelling the design process through mapping relation among actors and technical objects, it is hoped that this paper will contribute to show how reflection can be a way of extracting knowledge from design practice. This is important for design as a discipline when the work of design is part of knowledge production.

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## 2. Methods

### 2. 1. Design reflection

This paper is written using the ANT as theoretical based for design reflection to extract knowledge from project case. Reflection is used by designers to explain their design experience. Dorst (2003) wrote his book through reflection based on his experience as a designer, lecturer, and researcher. His method was adopted from reflective practice as developed by Schon (1983), concerning the art of learning from own experiences by practitioners. The practitioners' implicit personal knowledge, gained while they were working, can be transformed into explicit knowledge to be learned more generally (Ekomadyo, 2017). Architects' work is the best example of how this type of reflection is done in practice, through conversation and storytelling by the architect while he/she interacts with others to solve a complex design problem (Schon, 1983). Design is hoped to be a comprehensive effort for creative problem solving and also for learning to gain systematized knowledge (Dorst, 2003).

Related to design practice reflection, ANT – which was developed by Latour (1987) by following scientists and engineers in society – is able to trace architects and designers in society. ANT offers analytical methods to observe and de-scribe the actors' action in the society (Stephan, 2015). In ANT, to de-scribe means to follow actors – who can be scientists, engineers, architects, or designers– create a program of action, called a 'script', to make other actors do something. When the actors translate ideas, discourse, or texts into a set of technical objects it is called 'inscription'; on the other hand, when the actors translate a set of technical objects into texts, discourse, or ideas, or modify their translation, it is called 'de-description' (Yuliar, 2009: 125-127). ANT emphasizes the caution in writing down the risky de-description, slowly and cautiously: the more risk it is taken, the more careful it should be (Storni 2015).

For ANT, it is necessary to reflect the design process by following actors' relationship in each project stage. The relations are unravelled one by one, like an oligopticon (Latour, 2005), especially the role the technical objects – including design documents and elements – as non-human actors. Then, the actor-network reveals the big picture, like a panorama (Latour, 2005). This is done by drawing a socio-technogram to map the actor-network shaped by the many translations in each project stage, as diagrammatic maps to account actors' role in the collective and their concerns to each others. Socio-technogram is a tools to make the design networks visible.

This paper exercises ANT as theoretical base for design project reflection on University's community service program, especially to extract and describe the knowledge gained during the project. Kampung Dago Pojok in Bandung, that has been declaring as 'Kampung Kreatif' (means: 'creative urban informal settlement') through various creative movements such as visual and performing arts, was chosen as case. This kampung is chosen to assemble the creative ideas among university's academicians and local community activists into a collaborative works responding the creative cities issues. Through ANT approach, the success of the projects is not only viewed from the design result, but also how it can be part of network expansion between university and community activists on creative cities issues.

## 2. 2. Design in Socio-technical: from participatory to collective approach

The concern of design with the social dimension emerges from understanding that design is not only about the product as the result of the design process but also about the process itself and thinking that guide the results. The design process has social significance because the designer interacts with many actors to the appropriateness of the design result (Dilnot, 1982). In the social dimension, design is not only about formalism and building aesthetics but also considers user behaviour in order to deliver a suitable building and built environment and support human values (Sommer, 1983). The social dimension also generates many different methods drawn from the social and human sciences to be applied to the study of designers' activities (Matthews and Heinemann, 2012).

A social approach in design explicitly emerges from the participatory design concept for community based development. Participatory design is needed to involve society in democratic and decentralized decision-making in development, including planning and design processes. With participatory design, planners and designers work not only to create objects but also to build people engagement, a sense of community, group consensus, and social empowerment (Luck, 2003, Richardson and Connelly, 2005, Sanoff, 2006a, Sanoff, 2006b, Sanoff, 2007, Iversen and Dindler, 2014). Here, designers can facilitate, mediate, and trigger citizen participation to use their creativities to promote possible futures for the society (Manzini, 2011).

In architectural practice in Indonesia, there are two well-known forefathers of participatory design: Hasan Poerbo, who thought about how the built environment can contribute to a better living for the poor (Poerbo, 1993), and Y.B. Mangunwijaya, who used a cultural approach and phenomenological philosophy to empower marginalized communities (Mangunwijaya, 1988).

Conventional participatory design has been criticized because communities or societies are actually very complex social phenomena. In practice, social processes do not occur in a vacuum; the involved people and groups have their own identities and interests related to the external context of the participatory project (Shin, 2012). The stakeholders often have misconceptions of design work and knowledge about design is more based on individual opinion rather than technical, rational or procedural insight (Carvalho, 2009:18). Social relations in participatory are factually asymmetries, and it is potentially used to legitimize the power and elite political agendas (Palmas and Busch, 2015; Storni et al, 2015). Several participatory design practitioners have aimed their activities mostly at practical problems, so the theoretical dimension is often disregarded. Lack of a theoretical base potentially traps participatory design in merely fashionable activities and tokenism in development (Toker, 2007). Participatory design is often ideologically stuck on social empowerment, especially rehabilitation of the poor, but in contrast, the conventional design process always involves many actors in some kind of participation. There is no gold standard to distinguish participation and non-participation design (Andersen, 2015).

On the other hand, design can contribute to the understanding of complexity in the social sciences. For example, a social thinker like Lefebvre puts an emphasis on architectural design in his social thinking because he believes that substantive social reform correlates with spatial reform, where the architects contribute to spatial production through designing built forms. Lefebvre's concept of the triad of practical space, representation of space, and representational space gives a description of the relationship between built forms,

professional knowledge and the reality of social complexity (Coleman, 2015, Lefebvre, 1991/1974). The reciprocal relation between social form and built form is reflected in the words: 'When space is socially constructed, social form is spatially constructed.' Dovey (2010) related the role of designing built form to a complex social desire for a better future.

Another approach to relate design with complex social phenomena comes from Actor-Network Theory, a branch of Science and Technology Studies (STS) that was developed to criticize the social and technological determinism in understanding the relation between technology and society. STS correlates technological and social knowledge in a mutual and interactive relationship (Yuliar, 2009). ANT thinkers argue that if the adjective 'social' is labelled onto a phenomenon, it will determine the relation of other phenomena. ANT stresses that the root of the word 'social' comes from the Latin 'socius' or 'sequi', which means to follow someone in doing something (Latour, 2005), like Latour following scientists in society (Latour, 1987). ANT focuses on relations and their movement in the social and the natural world, explores how the resulting networks are composed, assembled, or sustained. A well-known but also controversial concept of ANT is to introduce non-human actors, such as technical objects or ideas, as participants together with human actors in these networks to create a social situation. Latour (1999) argues that we do not live in a society out there, but inside the collective of human and non-human actors here. Latour uses the term 'collective' to refer to some 'things' that are collected to detect the associated movement from the previous to the next, which can either be suspended or resumed (Latour, 2005). ANT contributes to see design as socio-technical activity playing vital role to shape the societies, by unravel or unpack the 'things' in design process (Storni, et al, 2015).

A key term in ANT is 'translation', which means how the network is shaped. Translation can be understood as the way the actors, human and non-human, adjust to each other to create a network, or 'a social process of aligning interests' (Hanseth and Monteiro, 1998). Callon (1986) maps the translation into four non-linear moments: problematization, when actors define each other; interestment, when actors lock each other to do something; enrolment, when actors position and interrelate their roles depending on others, and mobilization, when actors become representatives, or 'spokespersons', of each other. To take collective action, all actors must pass a narrow channel in the problematization moment, called obligatory passage point (OPP), which coerces them to converge certain topics, purposes, or questions. In general, OPP concerns non-human actors in the form of technical objects or ideas as a 'script' or 'scenario' for acting together.

In ANT, the script explains the role of ideas that are translated into procedures or collective statements of the actors and then manifested as a set of technical objects, i.e. the non-human actors in the social network. A script can stabilize human actor relations like the scenario in a theatrical drama, which binds together or organizes the actors in their performance, or like a script made by a computer programmer to guide the user of a computer program. The process when actors create a script is called 'in-scription', inserting certain values in a script is called 'pre-scription', and unravelling how a script was made is 'de-scription' (Ackrich, 1992, Yuliar, 2009). In the process of in-scription, there are four roles of the technical objects (as non-human actors) for (human) actors: 1) interference, when the technical objects translate the actors' goals; 2) composition, when the technical objects compose many translations to reach successive goals; 3) reversible black-boxing, when the technical objects fold the time and space of the actors involved; and 4) delegation, when the technical objects represent the

actors' expression, crossing the boundary between signs and things (Latour, 1999). In line with this reasoning, Latour introduced the term 'matters of concern' for social construction of technology, which means that technology is seen not only as a set of technical objects but also in their relation with human actors in the production and utilization of technology (Latour, 2005: 88-93). Non-human can maintain, strengthen or destroy the human actor relation by substituting, mediating, communicating (Rise, 2017).

ANT has an interest in design, and vice versa, because from ANT's perspective, design is just a word, not heroic or hubristic but constituting a careful and modest revolution (Hackney, et al., 2008). In design, we find humility of construction and building; attention to detail, craft, and skill; attention to meaning and language; to design is always to redesign; and involves an ethical dimension for good or bad design (Latour, 2008). ANT directs the designer's attention not only to matters of fact but also to matters of concern; not only to the concepts of function, sobriety, public space, etc. but also to how these facts are concerned by the actors. Design is understood not only as a work that is done to produce objects, but also as a concern for the assembly that is attached to the objects (Prieto and Youn, 2004). In architectural design, ANT has introduced the concept of 'relational architects': while designing, the architect plays a role as assemblage maker, working with time and manipulating space, and also empowering agencements, inventing convivial tools and creating ecological cycles (Patrescu, 2012). ANT meets design (and architecture) in the mode of thinking about complex interactions between people and things, between matter and meaning, and also to invigorate the research of architectural and design practices (Fallan, 2008a: 80-82). ANT also brings attention to the design process in communication and sense-making of the stakeholders, such as the designers and their clients, in the understanding of a complex social endeavour (Storni, 2010). ANT is not offered as a methodological toolkit but rather as a general theory, a conceptual framework to gain better sensibility toward the materiality, relationality, and process of design practice (Fallan, 2008b). By these socio-technical concerns in design, Latour suggest the designers challenge not only of visualising but also of designing concerns, by "drawing things together" (Latour, 2008, Stephan 2015).

One of ANT's premises involves artefacts or technical objects as participants in a network (Hackney, 2008), so the contribution of ANT is not only to unravel the network in the design process but also in place-making a kind of design results. Design studies also offer reflection on design practices as interplay between the process and the outcome (Storni, 2010). There are 3 evolutionary traditions in place-making studies (Morgan, 2009: 1-2, Sudradjat, 2012: 2): phenomenological/ humanistic, approaching place from the perspectives of human experience (such as studied by Norberg-Schultz (1991) and Tuan (1977)); psychometric, which analyses place by attributing numeric measures to psychosocial phenomena and then analyses these data using quantitative techniques (Patterson and Williams 2005); and social constructivism, which sees it as a socially constructed phenomenon (Dovey, 2010). Social tradition considers the construction of place more deeply to unveil intangible forces but it is often criticized for failing to account for the embodied, individuated nature of subjective experience and the link between subjectivity and the material world (Morgan, 2009). Latour (2005) also criticizes the social construction approach by questioning what kind of construction is used and how to account for that construction. Ekomadyo et al. (2015) have tried to combine both social constructivism and ANT's socio-technogram method to unveil and unravel public-market place-making and found that ANT's socio-technogram

can explain more easily what kind of social network constructed a place. Every constructed technical object are not only matters of facts, but also matters of concern, by aligning them with the human actors as socio-technical gatherings (Poderi, 2015).

ANT and design also meet in design reflection. Reflection is a method of extracting implicit practical knowledge (residing with the practitioners) into more explicit knowledge in order to be learned widely and more generally learned (Schon, 1983). Reflection is important when design is seen as a learning activity (Dorst, 2003) and design reflection can be made into a new epistemology of practice (Yeneva, 2011). In ANT, reflection is the activity to ‘de-cribe’ the designer’s self-inscription to become more narrative and make actor-networks of design visible through risky description (Latour, 2005, Storni, 2015). By turning design reflection into narration, ANT potentially opens the black-box of the design process, unpacking design practices and creating a new vocabulary of hybridization of the social and the technical by positing designers, other actors and technical objects symmetrically (Storni, 2010). Various actors who have different interests and agendas can give an account of how they act in negotiations, use tactics, and employ power to decide which set of technical objects is chosen –in the ‘in-scription’ process– as stabilized objects (Fallan, 2008).

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### 3. Result

#### 3. 1. Community project in Kampung Kreatif Dago Pojok: tracing the socio-technical process

To represent the socio-technical process of design work, this study used the ‘creative alley’ project in Kampung Dago Pojok, Bandung. This project was initiated by the researcher as part of a community service program of his university. It took place in Kampung Dago Pojok Bandung, which is well-known as ‘Kampung Kreatif’ because there are many communities based creative activities in this neighbourhood (Ekoadyo et al., 2013). Researcher chose to collaborate with Komunitas Taboo (KT), the initiator of Kampung Kreatif Dago Pojok, a well-recognized initiator of several grassroots creative movements by empowering local citizens with fine-art and performing-art approach (Prasetyo and Iverson, 2013). The researcher and Komunitas Taboo agreed to organize the project to make an existing alley in this kampung into a ‘creative alley’ by installing some architectural elements, where local citizens can learn, discuss, or creatively express their artistic ability.

The researcher intended to employ ANT as a design approach in the project. There were two reasons why ANT was intentionally utilized for this project. Firstly, ANT was assumed to be able to deliver tools to frame the social dimension of the project process by identifying the actors involved rather than by conventional participatory design. By framing the process and identifying the actors, it was assumed that the project’s outcomes would be more effectively and efficiently accountable. (Ekoadyo and Yuliar, 2014). Secondly, according to Yuliar’s model of pro-innovation situations (2011), ANT was used as a theoretical basis to extract practical knowledge from the project work to be published in an academic paper.

Project initiation was started by a meeting between the researcher and KT to synergize their program, mediated by a community activist movement in Bandung, known by the acronym FAP (fig. 1-1). The role of FAP, based on its knowledge about community activism



in Bandung, was as a mediator to build trust between the researcher and KT. At that time, creative city issues turned into controversies. On the one hand, these issues attracted large attention to the question of how creative culture can contribute to a better urban life; on the other hand, large attention was also attracted by political actors attempting to exploit these issues. The researcher also asked his students to join the program by synergizing their task in the architectural studio. Furthermore, KT arranged for the researcher's program to support a community festival called 'Festival Dago Pojok' in that year, which impacted the project timeline. KT also asked other actors to join the festival, such as local leaders, to contribute the infrastructure for the 'creative alley' and the association of creative communities in Bandung (BCCF), to provide support in the form of mass publicity and sponsorship.

After the project was initiated, a design brief followed. Conventionally, a design brief is written by the project owner to guide the design work to reach the aimed outcomes and outputs. However, in a participatory approach, the design brief is agreed and written together by the community and the designer. In this case, the design brief was discussed and agreed upon by the researcher, KT, and the students, at the project location (fig. 1-2a). It was also agreed that the project would be aimed at activating an existing valley behind KT's house, to be transformed by design into a 'creative place'. KT imagined that this alley would be a place where children could learn in a semi-open space and local citizens could gather and perform potential artistic competences, such as fine art, performing art, or traditional music. KT also informed that the local leader, called as 'Pak RW' mean a person who appointed as an administrative leader to manage the local community, would contribute to the project by building a ditch cover to enlarge the width of the alley to be used as 'creative alley'. In the design brief discussion, the researcher also asked the students to observe the real context of the project, interviewing local citizens and collecting other information to enrich their design strategies (fig. 1-2b). It was also agreed that the project would be implemented as part of Festival Dago Pojok in the same year.

After the design brief, the project was continued with a schematic design, after the students had elaborated their creative ideas about the 'creative alley'. As an integral part of the studio, their design work took place inside the architecture department of the university. As their lecturer, the researcher awarded their design work with academic grades (fig. 1-3). The project was continued with a working drawing based on a selection of schematic drawings, considering the technical and budget constraints for implementation. This working drawing was prepared by the research assistant, a junior architect, under the researcher's supervision and consultation with a contractor, especially for construction considerations. This stage resulted in a working drawing document and a budget plan as instruction for the contractor (fig. 1-4).

The working drawing was used as a tool for the contractor's work to construct any designed architectural elements on the site. At the same time, the local leader's labourers also constructed the ditch cover in the same place. During the construction process, neither the researcher's contractor nor the local leader's labourers met to coordinate their work in a formal way. All coordination of the construction work on-site was handled informally by KT on a daily basis, because the site was behind KT's house. In this stage, KT was the mediator for two different construction groups.

The constructed 'creative alley' was first implemented at Festival Dago Pojok. Three architectural elements were installed: canopy, hangers, and multipurpose boxes. The canopy



was installed to create a shelter for learning activities, the hanger for displaying artistic fixtures, and the multipurpose boxes to facilitate sitting, writing, drawing, crafting and performing art activities (fig. 1-6a). BCCF contributed posters displayed on the installation. The installation was handed over by the researcher to KT informally, but still was reported to university as community services program (fig. 1-6b).

The ‘creative alley’ occupied by local citizens to express their creativity through performing art, traditional music, crafting, drawing, and painting activities, and many other activities was published in several media (fig-1-7a). The publicity attracted visitors to visit the ‘creative alley’, to see how it was utilized to generate the creativity of local citizens (Fig 1-7b). Social media played an important role in spreading the ideas of Kampung Kreatif to the public at large.



**Figure 1** The stages of the community project to construct a ‘creative alley’ in Kampung Dago Pojok Bandung.

This project resulted in several technical objects as elements constituting the ‘creative alley’. The researcher’s community project contributed three main parts of the installation: canopy, hangers, and multipurpose boxes. All of the architectural elements were placed on the ditch cover installed by the local leader. As a place, the alley reassembled any kind of local citizen’s creative activities and connected them to visitors and the public at large through social media. The installed technical objects mediated assemblies.

The process of creating the creative alley, from project initiation to occupancy, involved many actors: the researcher, KT, students, local leaders, local citizens, and BCCF. Some actors were involved in some stages but not in others. Even in one stage, several actors were involved but there was no direct connection between them, only mediated by others. ANT offers a method to read actor involvement in each stage by tracing the collective movement of

human and non-human actor associations. With this collective approach, we can also unravel the social ties of the design process and analyse the social construction of place-making.

### **3. 2. Design in collective perspective: creative alley installation in the making**

To understand design in a collective approach, we must unravel the social ties in the design process. From ANT's perspective, the social is understood from its linguistic root, 'socius' or 'sequi', which means to follow, which can be interpreted as someone following others (Latour, 2005: 1-6). For following in the design process, ANT offers the term 'traveling' (Fallan, 2008a: 1-2,88-90), that is to follow the architecture in action in slow motion and with sharp observation, just like when traveling and enjoying the experience of the journey, to unravel the social ties. Design involves activities to mediate, transport, translate, and transform relationships between human and non-human actors, so reflection should be slow to allow for observation of slow and laborious actor deployment (Patrescu, 2012: 143, Latour, 2005: 218). In this paper, traveling the making of the 'creative installation' project was done by following the actors' interactions, starting from the point of view of the researcher (as reflector), registering how he had interacted with other actors in each project stage.

There are two methods to unravel the relationships between the actors: firstly, through tracing the relations between the actors one-by-one; and secondly, through mapping them into a bigger picture, a panorama, to see how the associations move collectively. The human actors traced in this project were: 1) the researcher, 2) Komunitas Taboo (KT), 3) the (architectural) students, 4) the local leader, 5) the local citizens, and 6) the urban creative community (BCCF). Starting from the researcher, the relations between the actors were traced one by one. Each actor had different goals, but each of them created an action program for other actors to do something to reach their goals collectively. There would be another scenario if some actors created an anti-program, i.e. decided not to do or resist an action, so there would be no collective action. Here it was also traced how inscriptions, as collective statements that were followed together, were created by each actor to instigate collective actions to reach their own goals. It was also identified how technical objects played role where inscriptions were made.

The relation between the researcher and KT was formed with the motivation to synergize two different activities. The researcher, through the community service program, aimed to implement academic knowledge to help, serve, or empower communities, in this case to deliver an installation object in Kampung Dago Pojok. On the other hand, KT had a program to empower the local citizens through creative events, with the peak event being Festival Dago Pojok that year. The researcher needed KT's support to legitimize his program to the local citizens in order to make certain that the program would be organized effectively and efficiently, while on the other hand, KT needed the researcher to contribute physical objects that could be utilized by the local people to support the success of the festival. The script that bonded both goals was the idea of the 'creative alley': for the researcher this would be the arena to implement the community service program and from KT's point of view it would support the festival. The role of the researcher was to design and install any technical objects to construct the 'creative alley', while KT's role was to connect with other actors to sustain the process and implementation of the installation. Several architectural elements were involved as technical objects in this script: the existing alley, KT's house adjacent to the alley, where most of the discussions were organized and the construction process was supervised, and the installation objects contributed by the researcher (canopy, hangers, and multipurpose boxes).

The researcher and students had a formal relationship as lecturer and students. The researcher wanted the students to learn from practice in a real-life social setting and challenged their creativity to respond to real problems, while the student had the goals of learning about design and acquiring an academic grade. The researcher wanted the students to explore their creative ideas and design vocabularies for the 'creative alley', and the students gained knowledge through the researcher's advice and supervision while they were designing, the way junior apprentices work with senior architects. Their actions were assembled by schematic drawings as the script, where the students drew and sketched their ideas and the researcher used the drawings to transfer his knowledge by supervising the students' drawing and sketching process. Beside the drawings there were other technical objects that mediated the translation: the existing alley and Kampung Dago Pojok, where the researcher taught the students how to observe and capture real problems, and the architecture studio in the university, where the researcher taught, advised, and supervised the students' design work.

The researcher and the local leader had no direct connection, although both were enrolled to contribute technical objects to transform the existing alley into the 'creative alley'. The researcher contributed the installation (canopy, hangers, and multipurpose boxes), and the local leader provided the ditch cover. Their relation was mediated by KT as the host of the 'creative alley'. The script that assembled them was the idea of the 'creative alley', which would be utilized for the first time at Festival Dago Pojok. KT delivered messages to them separately and controlled their work time at the moment of the festival. There were some technical objects involved: the existing alley and KT's house, where KT supervised the separate construction works of the researcher and the local leader.

KT also was the main mediator connecting the researcher to the local citizens. The researcher wanted the project to have a significant impact on the local citizens, while the local citizens wanted to be more recognized for their capabilities by the public through any kind of event, organized together with KT. The script that assembled the researcher and the local citizens was the idea of the 'creative alley' and many events held at this place, including Festival Dago Pojok. Several technical objects played a role in this script: KT's house, where the idea of the 'creative alley' was discussed between the researcher and KT and then disseminated by KT to the local citizens, and any kind of installation contributed by the researcher and utilized by local citizens.

The researcher, KT and BCCF previously had an informal relation, because they had the same concern with the creative community and had met each other at some events and discussions. However, in this project, the relation between the researcher and BCCF was only mediated by KT. The researcher, through KT, wanted BCCF to support the implementation of the 'creative alley' through its networks, including publicity and sponsorship, and BCCF had an interest to claim the event of Festival Dago Pojok, including the utilization of the 'creative alley' as part of the overall Bandung Creative City agenda. These actors were reassembled by the script of Festival Dago Pojok, where one of the festival programs was the implementation of the 'creative alley'. When the festival had been opened to the public, BCCF contributed several artistic fixtures, such as posters, pictures, and photographs, put in the hangers installed by the researcher in the existing alley, and created an 'artistic atmosphere' in the 'creative alley' at the beginning of utilization. Artistic fixtures, hangers, existing alley, and KT's house were the technical objects involved in the script created by actors.

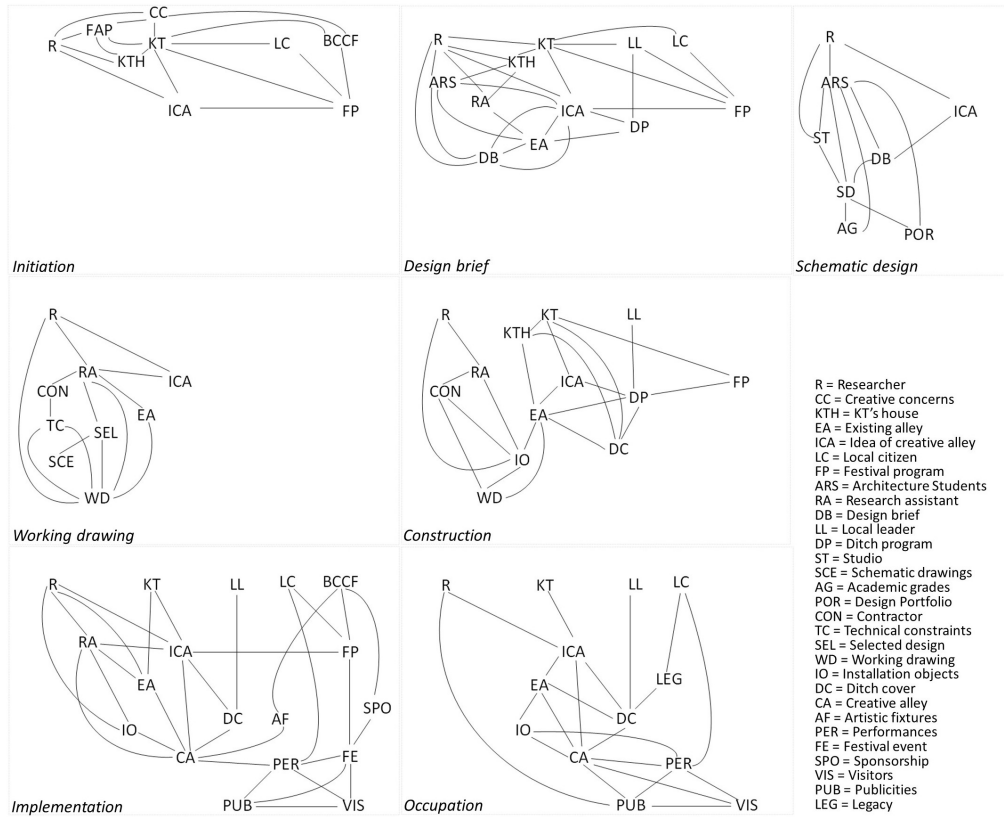


Figure 2 Sociotechnograms of the project stages

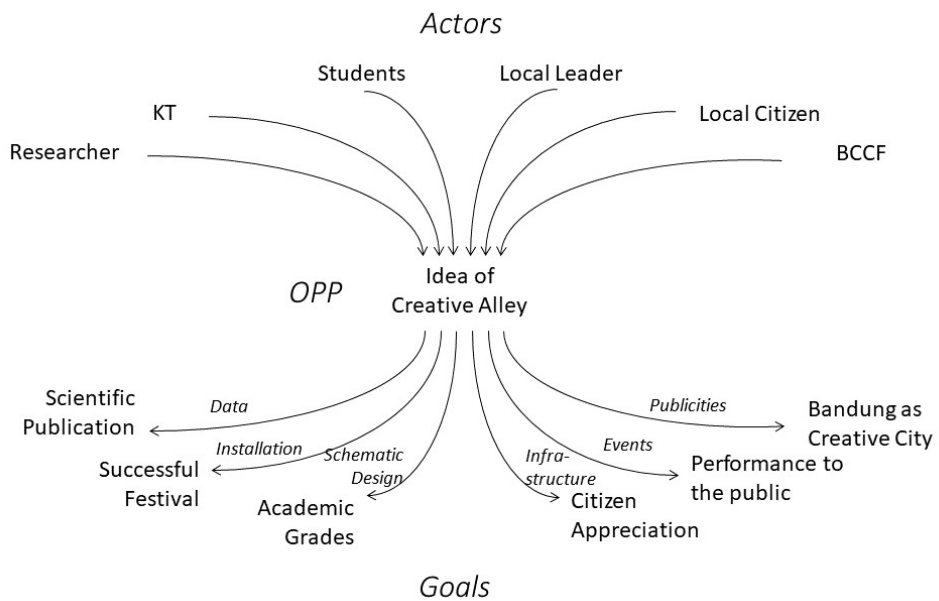


Figure 3 The idea of the 'creative alley' as obligatory passage point (OPP)

The panorama of all actors' relations can be shown by socio-technograms. The socio-technograms, which consist of sociograms mapping the human actor network and technograms mapping the non-human actor network, are usually utilized to make the actor network easier to analyse in an observed phenomenon (Yuliar, 2009: 81). A socio-technogram helps to see the panorama of the movements and composition of the networks in the different project stages. It can be seen which actors are involved in each stage: one actor can be involved in one or more stages but not in others, so there are stages with fewer and more actor involved (fig 2).

This panorama maps how translation occurs among actors through problematization, interestment, enrolment, and mobilization moments. Also, the obligatory passage point (OPP) can be identified, a narrow channel that must be passed by all actors to reach their own goals through collective action. It can be seen that the idea of the 'creative alley' was the OPP (fig. 3). This socio-technogram shows how the actors locked each other (as interestment moment) and were positioned to one another (as enrolment moment) variously in each project stage, showing that translation is not a linear process. The mobilization moment happened when each actor has become a spokesperson for the others through the idea of the 'creative alley' based on their concern with the community-based creative movement in Kampung Dago Pojok Bandung.

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## 4. Discussion and Conclusion

### 4. 1. Discussion

After travelling into the design process through following actor relation in each stages, this paper deliver three main findings as consequences when design is seen in socio-technical perspective. First, the design process is unravelled by mapping involved actors and technical objects in each stages focussing on the scripts created by actors to make others do something. For example, the constructed creative alley is script made together by researcher and KT with different goals: researcher wanted KT to support and maintain the creative alley for researcher's projects result, in other side, KT want researcher to contribute installation to support KT's program to empower local resident by art activities. Focusing in the script-making is important if design is seen as socio-technical -not only social- process.

Second, socio-technical approach will help to account the social construction of the place -as one of architectural design result- by accounting who and what constructs the place. This finding is derived from ANT concept of matter of concern: place is understood not only by identifying the technical objects installed as matter of facts, but also actors' concern to these technical objects; just like to attend not only the stage but also the whole machinery of a theatre (Latour, 2008). Whit this approach, the the construction of place can involve technical objects outside the place. For example, for 'creative-place' project in Kampung Kreatif Dago Pojok, place is constructed by inside technical objects: existing alley, ditch covers, multi-purpose boxes, canopy, hangers, and art devices as matter of facts; and also involve another outside ones: such as KT's house adjacent the alley, architectural studio in university, contractor workshop, and local residence houses, together as matters of concerns.

Third, responding Latour's call to designers for 'drawing things together' (Latour, 2008),



this paper argues that design is a kind of ‘pre-script activities’: every actor acts designing when he/she developing values before they make scripts, when professional designers use specific design devices in these script-making. In ANT, pre-script activities refer to what actors imagine before the create scripts, as like as designers imagine the design result before they draw the design objects. Here, the professional designers do not play role as Machiavellian prince in modernist design (Storni, 2015, Stephan, 2015) who determine the design process and result, but, as Storni (2015) delivers, put the other stakeholders as co-designers. Everybody can create prescription, but professional designers have specific design devices, such drawings, models, or presentations, to insert values on their scripts.

In the end of discussion, this paper suggests to bring the social concern in participatory design into the socio-technical concern of design in common. In socio-technical perspective, every design work is participatory in various kind of participation. Who and what participates in design decision can be traced through mapping human and non-human actors’ relation in each design stages. This argument also completes Papanek argument for ‘everybody is designers’ against the professional determinism in consumerism (Papanek, 1972). These design devices delegate the designers through substituting, mediating, and communicating (Rise, 2015) designers’ competences and skills to other stakeholders. So this paper suggests to use term collective design to conduct the socio-technical approach of design.

There are some benefit to utilize ANT’s socio-technical approach for design project, based on its perspective to see mutual relation between human and non-human actors, avoiding technical or social determinism in design approach. Comparing with technical approach in design process as usual, socio-technical approach will give concern how technical objects in design result are delegating the aspiration of human actors involved. This concern will increase actors’ sense belonging for design result, that can increase the inclusivity of design process and sustainability of design result. By ANT approach, the success of design project is not seen on design result only, but how it can be part of network expansion of actors involved during and after the design project.

Comparing with social approach, as like as conventional participatory design (PD), ANT put technical objects mutual with human actors involved. If PD mission tends to empower the community, that is difficult to be accounted in practice because of actors own interests even hidden agenda, ANT focuses on how technical objects represent or delegate the human actors aspiration. PD requires to achieve the consensus, where is also difficult because actors potentially betray, ANT focuses on the Obligatory Passage Point (OPP), a narrow channel that must be passed by all actors to reach their own goals collectively. Here, ANT offers “script-making”: a set of non-human actors such as ideas, texts, procedures, and technical objects, that are the parts of program of actions of each actor to make others do something. In practice of design project, ANT helps to arrange various ways of participation considering the limitation of budget, time, and resources. ANT gives chance for involved actors to make their own calculations to other actors, human and non-human including the budget, time, and resources, to reach their own goals in collective action.

## 4. 2. Conclusion

This socio-technical approach for design reflection of community project in Kampung Kreatif Dago Pojok Bandung results three main conclusion. First, design process is a collective action and can be de-scribed by unravelling actors and technical objects

relationship, focussing how human actors create scripts as set of ideas, texts, procedures, and technical objects to make other actors do somethings. Second, ANT support to account the construction of place by accounting technical objects installed as delegation of human actors involved. Third, responding Latour's concept of design to 'drawing things together', this paper argues that design is a kind of pre-prescription activities: everybody acts as designer collectively when she/he imagining results and developing values before create scripts. Here, the role of professional designers is determined by design devices that are used in the script-making to substitute, mediate, and communicate designers' specific competences and skills to other actors.

In this paper, ANT is hope to contribute to the design as discipline by its capability to unravel the design process in detail. As Dilnot (1982) said that design as discipline concerns in social significant of design process, Storni (2015) suggests to use ANT for design ontology to make design network visible. This paper concludes that ANT can 'de-cribe' the design process by giving an account of the socio-technical relations in the design process. Here, using ANT's terminology, to 'de-cribe' is to re-write any inscription made by actors involved in the design process. A socio-technical approach is important for including non-human actors in the actor network and seeing design as a collective process. The design process can be traced by travelling; not only by sitting there but also by acting here, tracing actors' relations to de-cribe architecture in the making by mapping how actors agree and disagree, shape alliances, scale and rescale spaces (Yeneva, 2012).

Raising social concerns in the built environment stimulates architectural and design thinkers to translate contemporary social philosophies and theories into the design of built forms. Influenced by Foucault, Sudradjat (2018) argues that good architecture is transformative, an instrument to transform subjects to complete humanity. Influenced by Deleuze, Dovey (2010) stated that the design of built form is linked to a desire for a better future. In case of ANT, Yeneva (2016: 273), influenced by Latour, argues that design triggers specific ways of enacting the social. ANT helps to understand how society works by appreciating how design shapes, conditions, facilitates and makes sociality possible. Further, is possible to exercise ANT not only to describe, but also to support participation in design process (Storni, 2015, Seo, 2015) and to transform design into socio-technical change (Stephan, 2015) by clarifying matters of concern and framing collective action of design.

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