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## FROM DESIGN PROCESS TO PROCESS DESIGN: LESSONS-LEARNED FROM COLLABORATIVE URBAN RESETTLEMENTS IN POST DISASTER RECOVERY

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### **ABSTRACT**

*In this paper we discuss our current research on urban resettlement projects as part of post tsunami disaster reconstruction in the city of Banda Aceh. As it normally found in great catastrophes this event has also left the city with an ample “vacant” space where both planners and architects eager to rebuild a better urban physical environment than that of pre-disaster. We attempt to understand how issues on collaboration could help urban planner and designer create a more streamlined disaster recovery process, towards a what-so-called creative place making through creative collaboration.*

*Our theoretical review on the issues of collaboration has helped explain the existence of the polarization originated from different approaches taken by practitioners in these two stages of a reconstruction project. Creativity may only be seen either in term of the quality of place making (process oriented) or the quality of place as itself (product oriented), but not in both.*

*We attempted to reframe the understanding of these phenomena with theories on collaboration. A retrospective analysis over four cases of urban housing reconstruction in Banda Aceh, which each has different characteristic of stakeholders, background political issues as well as its urban context, have shown that during the reconstruction process negotiations on stakeholders' interests was much more critical than those on ideas or concepts of the future urban physical appearance. Finally, towards the implementation of collaborative process we propose the current typical design process to be placed inside a framework of (collaborative) process design.*

**Keywords:** *design process, process design, collaboration, creative*

### **INTRODUCTION**

The tsunami disaster in Aceh, North Sumatra, has created tremendous national problems for Indonesia. More than 250,000 people have been confirmed dead and hundreds of thousands are still missing. 514,150 people have been identified as refugees, and more than 100,000 households have lost their homes. These are just rough numbers that cannot begin to describe how this catastrophe has affected the future of this devastated region. The non-physical aspects of this tragedy, such as social, cultural and educational issues, have clearly made the rehabilitation of the community in this region a very difficult task, without precedence. A major problem is how to redevelop the physical space to accommodate all the needs of the victims, to help them rehabilitate their lives.

On April 15, 2005, through a Presidential decree, the government of Indonesia has established a blueprint for the reconstruction of Aceh after the tsunami. The plan covers four main elements: community development, economic development, infrastructure development, and government institution development. The government has also realized that this project requires considerable resources, and can be implemented only with help from internal and external sources, such as official or informal foreign donations, from foreign governments or from non-governmental organizations (NGO). The blueprint still has to be elaborated in several phases in order to be technically feasible as a basis for implementation. Yet its implications have already triggered many comments and worries among the tsunami survivors as well as local people, who feel the program does not really reflect their needs in rehabilitating their life.

Physical reconstruction projects following a disaster bring into sharp conflict the goals, intentions, and methods of the many participants in the reconstruction effort. No matter how well-intentioned they may be, every party participating in the process is likely to suggest different solutions to the problem, based in its his or her own experience, culture, and beliefs. They are also likely to push their solution ahead of others', which who may consider less likely to meet the needs of the project. One example of such behavior is a recommendation of the government's master plan to locate the reconstructed housing to areas away from the coastline, where they are less likely to be affected by future tsunamis. This plan, which makes sense from a global economic and planning point of view, conflicts with the local social, economic, and cultural needs of the people it is intended to help, whose lives and livelihood revolves around the sea. It is further exacerbated by the beliefs and methods of the rehabilitating agencies, which in this case are mostly international NGOs. Many of their technical consultants have recommended design solution that doesn't fit local context.

Reconstruction and rehabilitation of this magnitude involves collaboration behaviors, which are defined as an agreement among experts to share their abilities in a particular process, in order to achieve the larger objectives of the project as a whole, as define by a client, a community, or society at large (Hobbs 1996). The various participants involved with the reconstruction project have made it unique by blurring the distinctions between client, contractor, and designer: the sponsors (international NGO) are not the ones who will use the product. But the survivors of the tsunami have little say in the reconstruction process. The Indonesian government itself could be considered a client, since it also has lost most of its infrastructure in the region. The contractor could be the local people who are the informal builders of their environment, or the various aid agencies whose resources are used in the process. The designer may be associated with the sponsor, which has its own standards for design in disaster recovery events, or the government whose policies dictate the nature of the intervention, or a team comprising a local university that was contracted by the local authorities to help in designing their future.

People tend to focus most recovery programs for post disaster communities on the physical rehabilitation of the environment. We recognize that physical destruction has had implications not only to the local community but also to a lot of institutions, private or public, concerned with the rehabilitation program. Theoretical implications of post-disaster case studies suggest that these vulnerable communities present widely varying opportunities for the diffusion of design innovations and urban reinvention (Ockman 2002; Hoffman and Oliver-Smith 2002).

From an academic point of view, this devastation presents an un-precedented opportunity to investigate the process of rehabilitation as a form of large scale collaboration. The study proposed in this research will analyze the problems and methods used in this process, and recommend steps that can be followed to alleviate them in similar cases. Its results will be applicable to other types of resettlement process following natural disasters, such as earthquakes, hurricanes, and fires.

## **COLLABORATION IN PLANNING AND DESIGN PRACTICE**

### **Collaborative Planning**

Discourses of theories of collaboration in planning practices have been more advanced than those in architectural practice. Rather than concentrating on issues related to technical and

communication aspects, investigations have been more reflecting on interrelationships between the actors of collaboration or project's stakeholders, such as: conflict assessment, mediation process or consensus building. Consensus building itself has become central idea in collaborative planning practice.

**Consensus-building**

Consensus building is defined here as a process that is truly facilitated, as opposed to merely chaired. A professional facilitator or a chair may act as the facilitator, or a task group may establish equality among themselves and achieve the ability to have freewheeling discussion (Innes and Booher 1999b). The processes use special meeting management techniques that allow all participants to be heard and be informed, and encourage discussion that is both respectful and open-ended. The techniques follow the interest-based model of bargaining (Fisher and Ury 1991), and assumptions and constraints are not taken for granted, but explored. Consensus building is basically built upon the practice of negotiation and mediation (Susskind and Cruikshank 1987). Ways of moving beyond interest group conflicts are being explored drawing on principles of conflict mediation and consensus-building. These emphasize the potential for collaborative discussion of shared concerns about local environmental changes, through which people can come to learn about potential impacts and possible ways of valuing and addressing them. Through discursive practices, people learn about each other, about different point of view and come to reflect on their own point of view. In this way, a store of mutual understanding is built up, a sort of 'social and intellectual capital. (Innes 1994)

Consensus building processes are not only about producing agreements and plans but also about experimentation, learning, change, and building shared meaning. It is proposed that consensus building processes be evaluated in the light of principles of complexity science and communicative rationality, which are both congruent with professional practice. It offers principles for evaluation and a set of process and outcome criteria (Innes and Booher 1999). Consensus-building work can build trust, understanding and new relations of power among participants, generating social, intellectual and political capital which can endure beyond the particular collaborative effort" (Innes 1994).

Collaborative planning is only appropriate under certain conditions. To determine whether the effort could be labeled collaborative or not Innes and Booher (1999) have outline a certain process criteria (Table 1) and its corresponded outcomes (Table 2). Experienced process designers and facilitators conduct conflict assessments before recommending that a collaborative effort be undertaken (Susskind et al., 1999). If key stakeholders have better alternatives to a negotiated agreement and cannot be brought to the table, they will not be. Accordingly, they do not have the potential to produce the kind of collaborative outcomes. They may well co-opt or anger participants. A process may focus on too broad a purpose to convince participants there will be practical solutions of use to themselves or a task that is inappropriate to their skills and interests. An unmanageable participant can drive others away. (Connick and Innes 2003).

Table 1: Process criteria for collaborative dialogue (Innes and Booher 1999)

- Includes representatives of all relevant interests
- Is driven by a practical purpose and task shared in the group
- Is self-organizing
- Is engaging to participants as they learn and interact
- Encourages challenges to assumptions and fosters creativity
- Incorporates many kinds of high-quality information
- Seeks consensus only after discussions have fully explored issues and interests and significant effort has been made to find creative responses to difference

**Collaborative Design and Creative Collaboration**

It has been widely recognized that designing is a social process. This phenomenon should be easily identified in architectural design setting. There are many different kinds of participants involved with a major building project. The various numbers of participants will be getting higher as the size and complexity of the project are getting bigger. In line with the project complexity, the

context complexity will also contribute to the level of complexity for the project as whole. What is meant by context here is not the context of the building where it will be located but rather the context where participants perform their design tasks according to their own role. It could be distributed location in term of geographic context, as it usually happens, but at the same time it could also be collocated (Schön 1988).

Table 2: Outcome criteria for collaborative dialogue (Innes and Booher 1999)

- \* Produces a high-quality agreement.
- \* Ends stalemate.
- \* Compares favorably with other planning methods in terms of costs and benefits.
- \* Produces creative ideas.
- \* Results in learning and change in and beyond the group.
- \* Creates social and political capital.
- \* Produces information that stakeholders understand and accept.
- \* Sets in motion a cascade of changes in attitudes, behaviors and actions, spin-off partnerships, and new practices or institutions.
- \* Results in institutions and practices that are flexible and networked, permitting the community to be more creatively responsive to change and conflict.

From our own experience, we can observe that simply working together and talking about the same subjects do not necessarily indicate that we have been doing collaboration (Sudweeks and Allbritton 1996). Dana Cuff has observed that participants in collaborative design “did not necessarily participate equally or collaboratively” (Cuff 1991). It is therefore important to define what determine a particular working together in a group as collaboration. Steiner emphasized the importance of process conducted in a group in relation with the group productivity to reach the goal. People work in a group in design settings to take advantage of what calls process gain (Steiner 1972). The success of collaboration can be achieved if we have accomplished something in a group which could not be accomplished by an individual. In this case, Shea and Guzzo (1987) has defined three factors that play a major role in determining group effectiveness, they are task interdependence (how closely group members work together), outcome interdependence (whether, and how, group performance is rewarded), and potency (members' belief that the group can be effective). Basically, in order to understand the distinction of collaboration we need to understand the essence of collaboration, which can be explored in the following aspects: communication, meaning, worldviews, and compromise (Kalay 2004).

Working in teams requires skills of the team members to communicate and collaborate. The aim of a design team is to share knowledge and information in order to get a better design. Shared understanding is a mutual view amongst the team members on relevant design topics and design activities. Therefore shared understanding is an important condition for team design and team decision making. An important problem of team members in social interaction seems to be to synchronize their activities and to achieve shared understanding among team members. Working together effectively requires constructing a shared understanding on the design content within the team (Valkenburg 1998). Collaboration is much more than sharing ideas and views about a joint project. It is a state of mind: a willingness to listen, as much as it is a willingness to talk. Furthermore, it is a willingness to open oneself to the possibility of discovering and joining in the formation of new paradigms, as well as to risk failure (Shibley and Schneekloth 1988).

Collaboration is a difficult task to be performed. Many people think that they have been performing collaboration, but in fact what they have done falls to cooperation or a form of coordination. Mattessich and Monsey (1992) have drawn the distinction of these two words from collaboration. Cooperation is characterized by informal relationship, without any common mission, structure or effort to share together, so virtually there is no risk happened to any participants. Coordination is characterized by more formal relationship and understanding of compatible missions. Although there is some share and divisions of roles, but still the authority rests on each party. Therefore the risk is still not too significant here. According to them collaboration sit on the most risky situation to be shared among participants, authority is determined by the collaborative structure. It needs full commitment to a common goal, and consequently the level of trust must be higher than those within the other two.

These definitions could also lead us to a spectrum of the collaboration itself, that collaboration may be understood in an array of its intertwined components. Based on its purpose; interdependence of its participants; management under which it is conducted; and its duration, we could diversify collaboration into association, teamwork and creative collaboration (Kalay 2004). The distinction of each type of collaboration is very clear particularly within the context of professions. The main purpose of association is to expand the range of services among persons with different expertise. Collaboration is generated here not based from problem-specific but rather as part of business arrangement. The risk of losing members during the collaboration is not so critical since interdependency among participants is not a prerequisite, unlike that is in the teamwork setting. Here coordination plays important role to sustain contribution among participants. The purpose of teamwork is division of labor. The coordinator's task is mostly either scheduling or resolving conflicts, as a management strategy for handling the division of labor. Most of the collaboration lasts for long term period. Again, like association there is not so much risk of collaboration in a teamwork setting.

One of the significant as well as unique characters of collaboration is in the creative aspect of working together (Kvan 2000; Kalay 2004). This idea shapes the distinction of the third form of collaboration which is defined as creative collaboration. Design collaboration requires a higher sense of working together in order to achieve a holistic creative result. It is far more demanding activity, more difficult to establish and sustain, than simply completing a project as a team. Perhaps it is one of the ideal pictures on what basis collaboration should be built. Consequently, it becomes interesting, or even challenging, to find out what kind of circumstances that will encourage the implementation of creative collaboration.

### **Social Aspects of Post Disaster Reconstruction**

People tend to focus most of recovery program for post disaster communities on the physical rehabilitation of the environment. We recognize that physical destruction has brought implication not only to the local community but also to a lot of institutions, private or public, concerned with the rehabilitation program. Theoretical implications of post-disaster case studies suggest that these vulnerable communities present widely varying opportunities for the diffusion of design innovations and urban reinvention (Ockman 2002; Hoffman and Oliver-Smith 2002). However, the issues of how to rehabilitate the social and cultural factors of the destructed built environment don't get any enough attention.

The theoretical basis of the investigation on the social aspects follows Berger and Luckmann (1967) theory of social construction of reality, which claims that each participant in a social process, such as design process understands the situation differently, as dictated by its culture, education, and status. By referring to this theory we can understand the unique social phenomena in a post-disaster community that usually emerges right when the recovery process is begun. It was almost universally the case after a calamity, most of the survivors returned to dwell again in the disaster zone. Even communities suffering extensive damage from a disaster that is a result of environmental mismanagement will develop elaborate rituals to recover the same unsustainable environment (Hoffman 2002). Design historians has examined the similar phenomenon has happened throughout extraordinary natural disasters such as the recovery of Lisbon into a modern commercial city after the 1755 earthquake (Maxwell 2002). The claim that the tendency to recover the same unsustainable environment only occurred in low-income and unsettled communities is weak. The fire on residential area in Oakland Hills is one of the examples (Platt 1999). According to Horwitz (2005) this phenomenon is related to nostalgia, which is understood as forgetting about change a form of amnesia in reverse. Instead of forgetting the past, one remembers it too much. She suggested the implementation of sustainable design as solution for post-disaster communities should be accepted as a slow and shifting reconstruction process promoting the balance between physical or technological processes and social processes, human and non-human aspects, the public and the private.

## **CONCEPTUAL FRAMEWORK**

### **The Working Term of Collaboration**

For this study the term collaboration presumably is understood through general ideas that have

been generated through the literature review and its applicability to large scale construction projects. If we want to characterize collaboration as a culture, these ideas do not exactly express how collaboration can be identified. Schuman (2006) has compiled several terms of collaboration from numerous fields. Similarly, there is no single way we can define specifically the culture of collaboration. Kaner (2006) in the same book wrote an article based on discussion he led involving five executives on the topic "What have we learned about creating collaborative cultures in our organizations?" The final conclusion is the participants do not share the same meaning and vision of a culture of collaboration. However, there is agreement that talking about collaboration is actually talking about participatory values. A particular context of collaboration will have its own manifestation of collaboration.

Most literatures agree that collaboration is a difficult process to implement. One essential condition towards the effort of successful collaboration is to avoid using a mechanistic world view. We will either fail to identify many of the most important outcomes or undervalue them. (Connick and Innes 2003)

In their proposed models of planning and policy making, Innes and Booher (2003) place collaboration as the model that best deals with high diversity and high interdependence of interests. Collaboration can be built through authentic dialogue, where reciprocity, relationships, learning and creativity among the participants are built upon. Within this system it is expected that what in my understanding as participatory values: shared identities, shared meanings, new heuristics, and innovation can emerge.

### **Design Team and Level of Analysis**

Hundreds of multinational design and construction firms have been involved with the reconstruction project in Aceh along with several other institutions, such as: donors, non-governmental organizations, and many other that also come from various countries. Currently there are 1,120 organizations in the field managing 1,044 projects. Total fund that has been accumulated so far is \$4.6 billion of \$8.2 billion total estimated budget to complete the reconstruction process (BRR 2006). Yet the progress of the reconstruction project two years after the disaster has indicated the symptom of typical problems of large scale construction project. The Agency of Rehabilitation and Reconstruction of Aceh and Nias Badan Rehabilitasi dan Rekonstruksi (BRR) as the governmental body responsible for coordination of whole reconstruction projects has not been appreciated well for its performance, even many consider it gives contribution to the complicated problems emerging during the process (Acehkita 2006a, 2006b).

The complicated situation in this reconstruction project is clearly a challenging one seeing it as potential field of researches in construction process including within its sub-interest collaborative design. This has been one of my reasons why I choose this large-scale construction projects as the case for my dissertation research. However, with such a complicated and unique research context I realize I have to be extremely careful in determining the scope of my research, especially the level of analysis and unit of analysis. Reconstruction project for the tsunami victims in Aceh is quite different from the typical large-scale construction project, which can be considered as one single project. Reconstruction project in Aceh comprises hundreds of project in various scales. One project and the others are rarely under single project management except the coordination by BRR, which is actually intended to avoid chaotic situation in the project field, such as project duplication in a site location. This situation is certainly open to many possibilities of level of analysis for a research in organization as I intended as part of my fundamental study for the dissertation.

By referring to individual-organizational scope of issues, I have been trying to describe various level of analysis that can be applied on this reconstruction project. Figure 1 might illustrate my understanding of the various potential level of analysis for research in seeing from various level of individual-organizational-based analysis. In macro level, there are quite some possibilities to conduct researches, where the organization could be BRR related to its position as the branch of government of Indonesia, or multi-national funding agencies as Oxfam in relation with its donors, or even a more global organization such as the UN Habitat as part of the UN institution. In micro

level, I think there are a lot more possibilities of organizational cases could be taken seeing the many institutions, either it is private, public, or even multi-national organization involved with the reconstruction. Perhaps the unclear and complicated organizational situation would make it better to do the analysis based on meso-level organizational approach considering the hard characteristic of the project context, e.g. tsunami, post-disaster trauma, Aceh, etc (Cappelli and Sherer 1991), or considering the possibility to cover the micro-macro phenomena found in this project (House et al 1995). There is even possibility of doing cross levels analysis as proposed by Hackman (2003). Bracketing one central phenomenon in certain level in the dynamic of reconstruction process can help explain the social phenomena on the other level. Let say in this case the involvement of foreign professionals in the dynamic of reconstruction process might open possibility to understand the culture of multi-national firms whose influences in building construction industry have been growing up rapidly in many developing countries.

For this study I tend to employ my analysis on the group level of analysis. I consider this level as the most appropriate since the unit of analysis of my study is the design process. I will investigate the characteristic of collaboration in the design process conducted by people or individuals in the design works. These occur within what so called design team in a construction project. However, design team is quite different from typical team discussed in organizations theory, where it is usually identified as embedded or within organization (Ilgen 1999; Kozlowski and Bell 2003). Team members in design team come from different organization (Figure 2). It is not embedded in a single organization.

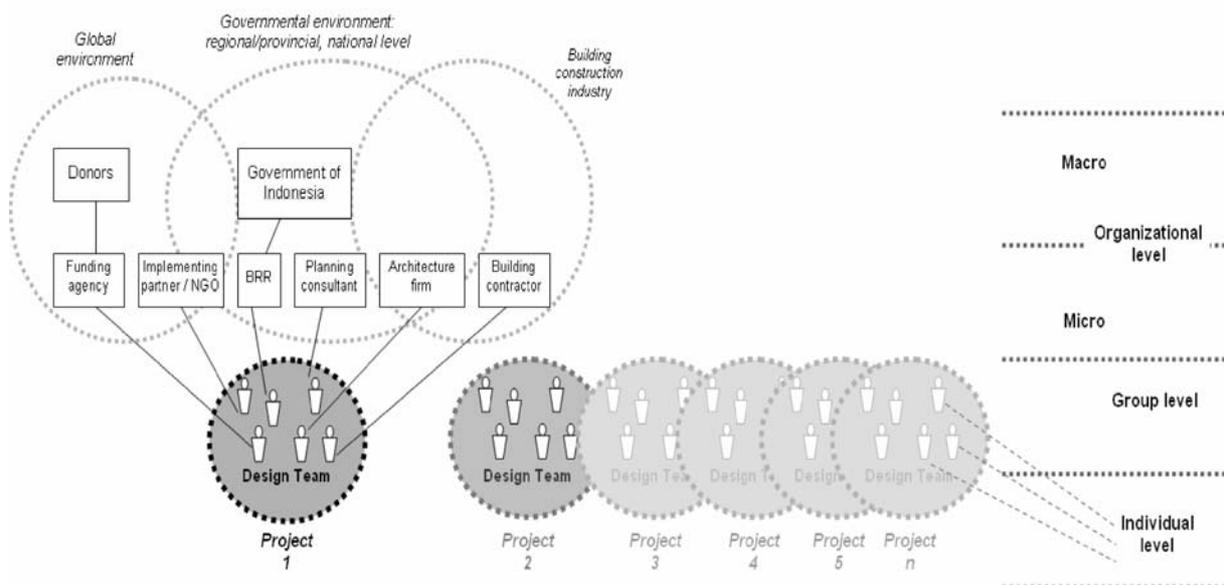


Figure 1: Organizational context in Aceh Reconstruction Project and level of analysis

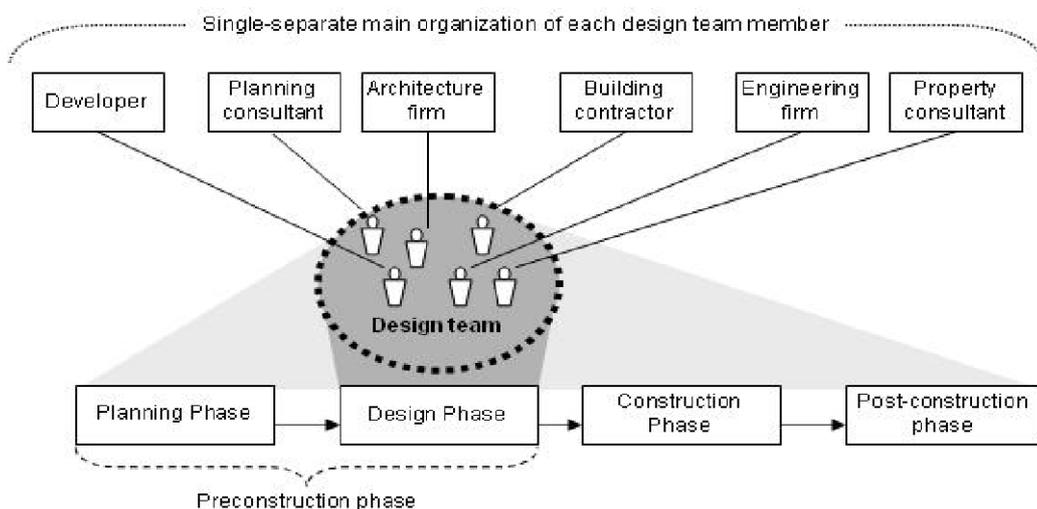


Figure 2: Design in team in the context of large-scale construction process

My reason to focus the study on design process is also to be consequent with the main idea of the scope of design works in large-scale construction project. In large scale construction project, there is no independent actor that can handle solely one construction phase relying on its professional skill. Consequently, architect will not be able to manage design process on its own authority without involving other disciplines, such as: planners, building engineers, or quantity surveyors. The more complex and larger the project, the more urgent is the need to include professionals from other discipline in the design team. Considering this fact I will develop my study upon the theories of team performances or group processes, sub field of organizational behavior that is relevant to the nature of temporary organization in design team.

## MAPPING DESIGN PROCESS INTO PROCESS DESIGN

Within the scope of a large scale project as the reconstruction in Aceh, implementing process design in a particular project does not automatically guarantee improving project performance. One project is interdependent to other project as long it is under the umbrella of Aceh rehabilitation and reconstruction program. There were many problems that emerged from the failure of participants of different organizations working on different project in same location to coordinate their works. Most common problems are such as housing building units have been completed while the infrastructure is not finished yet. Even in worse cases, the infrastructure has not been planned yet. If process design can be standardized as coordination system among projects in the reconstruction process, these problems can be reduced significantly. One of the key is the possibility to create a process map. (Straus 2002) Mapping the process of each interrelated project will enable the attempts to coordinate the projects in a system. This might open opportunity to integrate the advanced collaborative system that has been developed in architectural design area but up until now it seems irrelevant to what happened in the real design practice.

It is quite different from the process design map by Straus in term of its role for a collaborative planning process. Straus' map is a map of a plan, which means to help people visualize a process of collaboration in advance and make them able to identify any potential problems and to have a sense of assurance that consensus building will be managed in an organized methodical manner (Straus, 1999). In this research we attempt to integrate Straus' process design map as part of an evaluation of how the ongoing collaborative process work according to the map. The process design map visualizes the mapping of inter-linking between one meeting and another that make up all series of meetings in a collaborative planning process. Each node in the map just represents a meeting. Our representation system could clarify what happened in the meeting. The graph in figure 3 below simply illustrates how these two representation systems could be integrated.

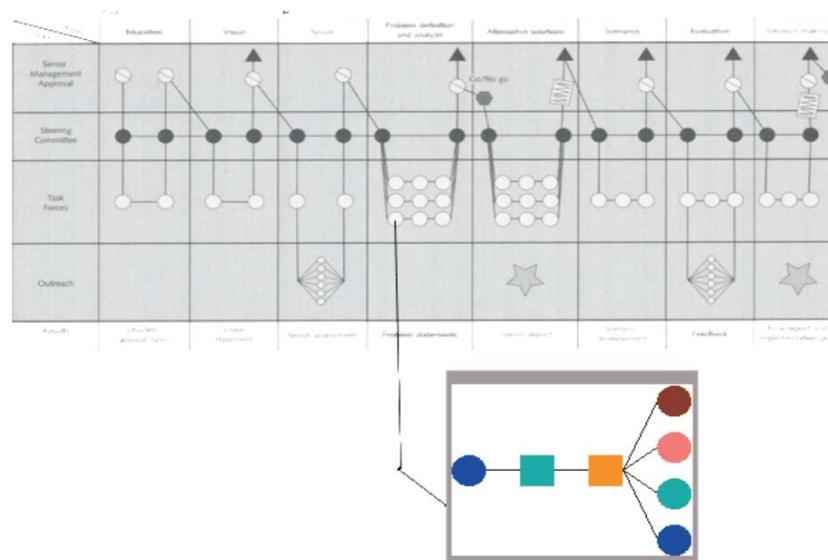


Figure 3. Proposed design process representation system, integrating our design process representation system (Hamid et al 2006) into process design map of collaborative process by Straus (2002)

## CONCLUSION

### (Summary of findings on case studies)

Three case studies have been chosen as the setting to examine the proposed collaborative process design representation system. All cases take the reconstruction projects for the Tsunami disaster victims in the Province of Aceh, North Sumatra Indonesia as the context. From an academic point of view, this devastation presents an un-precedented opportunity to investigate the process of rehabilitation as a form of large scale collaboration.

Within the scope of a large scale project as the reconstruction in Aceh, implementing process design in a particular project does not automatically guarantee the improvement of project performance. One project is interdependent to other project as long it is under the umbrella of Aceh rehabilitation and reconstruction program. There have been many problems emerged from the failure of participants of different organizations working on different project in same location to coordinate their works. If process design can be standardized as coordination system among projects in the reconstruction process, these problems can be reduced significantly. One of the key is the possibility to create a process design map. Mapping the process of each interrelated project will enable the attempts to coordinate the projects in a system. The three cases: housing in urban context; housing in rural context; and a fishery auction center, all of them have been finished. The design processes that had been going through the completion are mapped into the proposed process design representation system (see figure 3).

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