Introduction of design culture as approach in endogenous regional development: a study case in farming community of Sabrang Village, Central Java, Indonesia

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Abstract. Within Design Science, Design Culture is a branch focused on regional development through design principles and participatory tools designed to intrinsically understand endogenous potentials. Designing living is a goal/output based on recognizing regional “color” and facilitating the community for economic sustainability, social acceptability, and environmental soundness. Anthropological/ethnographic study embodied in material culture research is applied practically in learning about life in the field to incite curiosity and learning reflexes. In experiencing communal living, student-participants Observe-Collect-Map valuable tangible/intangible potentials (treasures), and analyses for presentations, ideate visions and co-design with local community as one of stakeholders. As an example, UNS-FSRD Design Culture Laboratory collaborates with UNS-Agriculture Faculty and GAPOKTAN Sedyo Makmur to re-develop Rojolele Delanggu Rice and community-based plantations in Sabrang Village, Delanggu.

1. Introduction
Design science, a term first coined by R. Buckminster Fuller in 1957, is a pinnacle of scientific design that addresses the design integrity to problem-solving mechanisms by gathering the facts brought by everyday experience leading up to a paradigm shift that focuses on the regenerative aspect of living, instead of the extractive force created by the concepts of industrialization. Fuller proposes a design discipline that could ignite socio-economic revolution through applying operative principles such that found in the context of Earth’s ecosystems [1]. As a discipline, design science is found in universities such as Chiba University (Japan), Lund University (Sweden), and University of Antwerp (Belgium). Design as defined by Fuller, is a deliberate ordering from a seemingly chaotic randomness, an act of reading patterns found in the environment and inter-relate them to create a comprehensive perspective.
Design is a ‘thoroughly developed system’ that implies the presence of intellect as opposed to a mere superficial embellishment of things. Science on the other hand, is a discipline whose methods set in systematic order the facts of experience and therefore, becoming an essential tool in the field of design. Design science thus, involves the application of laws and principles and use two greatest faculties mankind has been equipped with: mind and heart. Just as cheetahs are aspired to run, human beings are aspired to solve problems. The function of design science, therefore, is to develop knowledge and decision-making mechanism for solving human and environmental problems in relatively possible future scenarios by introducing novel artifacts that will fit the environment in which human co-exist with other living beings. As a simple anecdote, a designer created a crossing mechanism such as bridge, that will become a vital solution for the community to cross the swift currents of the river.

Design science itself is a branch of knowledge that can enrich human life and culture. The field has scope in various scientific focuses that are significant for establishing a good way of living, for example there are 12 research laboratories of design science in Chiba University, including: product design, design management, material planning, morphology design, communication design, human informatics, design psychology, commercial design, environmental design, humanomics, contextual design, and design culture.

By definition, ‘design culture’ is built from two words: design and culture. Each of which has a specific meaning according to its scientific context. The word design in design culture is not merely perceived in its logical context but has a meaning that substantially implies the elements of values, will-generating, and spirituality. As a case, in the Japanese local term, the depth of the terminology of ‘design’ can be perceived in a word ishou (Jp. 意匠, merging two sinographs 意 (i) ‘will’ and 匠 (shou) ‘craft making’ [2] as opposed to the loan word dezain (Jp. デザイン– written in Japanese katakana). The first sinograph, 意 (i) has two particles denoting the immaterial heart or kokoro (心) and sound (音 - oto). Together, this ‘sound of heart’ elucidates the expression for intention or will. The next sinograph 匠 (shou) consists of an axe framed with a box, denoting a creation of skill through making things.

According to this, ishou (design) then defined as an effort motivated by the heart of a designer in materializing what is intended as perceivable objects by using his skills through his hands and the tools he utilizes. Following this line of thinking, the true meaning of design by practice therefore, is ‘to transfer the will (or information perceived through experience, and intellectually processed in the kokoro) into forms (that contains value)’, and to transform the consciousness of needs and desires into the symbolic. A design work is a work that represents the designer, if the designer is sincere in his work, then the work will be good, and vice versa. In the context of output, the design in ishou terminology can also represent the seriousness and endeavor to infuse the work with the ‘spirit’ or ‘soul’ of the designer, so that the work embodies a spiritual meaning as well.

In the context of culture, the Japanese dictionary of Daijirin (Matsumura, 1988) notes the relevance to the field of design culture is the overall style of behavior or lifestyle that is learned, shared, and communicated by people to form society, for example: language, customs, morality, religion, etc. In cultural relativism, each human group has an individual culture, and each individual culture has its own values, and there is no difference between high and low, superiority and inferiority between them [3]. In that definition, culture is the ways of living that characterizes a community that is formed from various influences and reasons for the cultural diversity within a nation.

From this definition, design culture is a discipline within design science that focuses on designing [ways of] good living with determination, dedication, sincerity, and kindness with a vision to create a sustainable community development through analyzing tangible and intangible forms of culture where different values are held. The process of design culture necessitates the understanding of “what should be” by analyzing tangible and intangible elements within a communal culture and region recognized as “treasures”. Therefore, what differs design activity of a Design Culture Unit from others is the amount of experiential learning which are majorly performed outside of classrooms. “To learn about life in the field” (Jp. 野に出て生活を学ぶ-no ni dete seikatsu wo manabu) has the meaning of becoming actively engaged in learning the ways of life and wisdom from the local people and their field of living. It is a
precept incorporated in the design culture research methodology called the PLA or Participatory Learning Action which aimed at exposing oneself to conditions where designers could directly come in contact to analyze potential resources and material culture indigenous to a region. Learning, in Japanese understanding, is ‘knowing by active participation of the body (jp.体験-taiken [bodily experience])’ where one’s bodily sensorium comes in direct contact with things such as matters, actions, substances, or other bodies, and knowledge is consolidated through thinking and reflecting with the sensing/feeling body. Akin to how a child learns from his/her surroundings, from this experience designers identified techniques of collecting information and knowledge. This paper will explain how the methodology is generally used in executing design culture research and activities. As an example, a case study of agricultural community development project in Delanggu will be brought upon to illustrate the activities of Design Culture Laboratory of FSRD UNS.

2. Research objectives
Three main objectives are highlighted within this paper: 1) to provide an introduction and explanation related to design culture in terms of definition and scope of activities. 2) to define the methodological approach and general implementation in the field. 3) to provide an example of design culture project currently being carried out by the Design Culture Lab. FSRD UNS; a long-termed project carried out in Delanggu District, Central Java Province, Indonesia.

3. Research methodology
In design culture activities, every discussion requires an analogous approach with the help of visual representations. Analogies are part of inductive reasoning to enable the students/designers at solving seemingly chaotic problems, bridging factual data and other information received through participatory observation to lines of thought and linking them with other concepts that have been previously understood to form a comprehensive paradigm. From this process, after a macroscopic scope of the activity is grasped and all involved in the project is informed, the next approach of practical implementation in the field will be illustrated by using the study case conducted by UNS Design Culture Laboratory in Delanggu district.

4. Research results
There are two research results presented here. One relates to visual analogies and the other concerns with the tools and approaches used in design culture research.

4.1. Design culture activities
At a macroscopic level, the activities of design culture are described in the following seven pictures:

Figure 1-A visualizes the children who are being guided by their parents while visiting their hometown. Because the area is new to the children, they are very enthusiastic about seeing the sights and objects in the area as they walk. With high interest and curiosity, the children asked many questions to their accompanying parents regarding the objects they saw. With note-taking tools, they also record and document the object as data that they can store and remember. By analogy these children are students/designers who position themselves as external support system who are enthusiastic about seeing new areas in the field survey activities of Design Culture laboratory, and while being guided by “parents” or the local community they ask a lot of things that are new to them.

Figure 1-B visualizes the children gather and exhibit various interesting objects they have discovered. Using a magnifying glass, they see details of the object and share these details with their playmates. In this context, after discovering and documenting interesting matters and objects in the survey area, in-depth investigation is held with cross-disciplinary research tools to raise discussions concerning the meaning of things, values, and their potentiality for further development.

In Figure 1-C children are gathered in the living room of a traditional Japanese house. In the middle of the room there is an irori or a traditional sunken hearth used for cooking and warming the body in cold season. In this room, the children create sitting position around the irori while their parents are on
their own ends with a higher seating. Together they spend time by telling stories about the village and their experiences. From the picture, it is important for students/designers to experience the life of the local community by being a part of them. Not only seeing the objectified aspect of an artefact but also understanding the immaterial, subjective feelings and emotional quality that are created by a person/people in the interaction with the artefact, that in turn forming and shaping ways of thinking and habit shared in the community such as how the irori was created in a way that could induce formation of sitting and what irori – in terms of shape, space, ways and time of usage means to the humans who use it.

Figure 1-D illustrates that for the local people, being sceneries of everyday lives the potentiality of matters and things around them has become so undistinguished, that they are no longer sensitive to these existing treasures. Usually when the survey team comes, they will say that "there is nothing here". However, when the students/designers are present as external support system, they could observe a lot of local potentials, and in the process the local community also learns to re-recognize, becoming teachers and providing various narratives to the students’ inquiries.

Figure 1-E visualizes how to process the specifications of the local potentials, the actors, the time and history, the location and proximity and so forth. There is a lot of data related to local potential that is difficult to memorize. Therefore, it is important to make a treasures-mapping such as the visuals that are displayed, both for mapping the intangible and tangible potentials.

Figure 1. The flow of design culture laboratory activities

Figure 1-F shows where the potentials have been collected, analyzed in depth, and mapped, then shared in the forum both to the collaborating design team and internal stakeholders to provide encouragement and stimulus in the subsequent development process.

Figure 1-G shows a handful of objects that attract children's imagination could produce a variety of games. With the power of imagination and creativity, students/designers can respond to stimuli from
various mappings that have been made into powerful ideas, to generate sustainable designs for local communities while appreciating various wisdoms that exist in the area. In this context, ideas for development does not always come from a problem, but also through analyzing the findings of potential resources.

4.2. Field research tools
Based on the analogical narratives, basically design culture is a design discipline whose activities are mainly focused on community-building through recognizing and make apparent things considered as local treasures and materialize these local potentials as a source of communal strength and resiliency by designing systems and products that would anticipate future possibilities. The positioning of external support system such as students/designers as a part of the local community and as a learning mechanism is a significant process that needs to be experienced.

Within theoretical tools lent from the field of social sciences, one lent from structural anthropology is the concept of ‘bricolage’. It is used as a framework in navigating lines of thought during research, engineering design culture activities as well as understanding system/product designing (Figure 2). In The Savage Mind (1962), Claude Levi-Strauss the French anthropologist used the word bricolage to describe the skill of using whatever is at hand and recombining them to create something new.... The bricoleur (Fr. ‘bricoler’ – to tinker) works with his hands in devious ways, puts pre-existing things together in new ways, and makes do with whatever is at hand. The working of the bricoleur is parallel to the construction of mythological narratives [4]. In Design Culture, development is carried out based on narratives and evidence of the past and what are the present steps collected in the treasures-maps. In this context, the bricolage approach is to generate thoughts and create new things, from matters and materials available in the present with references from the past by using “hands-on” skills possessed by external support system and internal actors. Bricolage is also fundamental in the process of designing living, which is to design for socio-environmental sustainability and life resiliency so the community can prosper with what they have.

Figure 2. Research tools of designing living process in design culture laboratory

In field activities, the initial precept of ‘to learn about life in the field’ induces the students/designers to position the local community as teachers, both parents and children, and the area of exploration as a place where signs are gathered. In strategizing the development, the design team acts as a facilitator who positions the local community as the "main actor" of the project. In the stage of treasures-mapping, the PLA method employs several approaches of map-making such as social maps, resource maps, service maps, mobility maps, seasonal maps, and so forth [5]. These works will be delivered in focus group discussion (FGD) to produce collective agreement, after which ideation process is carried out using brainstorming and visual-storming tools. The resulting ideas then be brought to another FGD with the stakeholders to scale the priorities of development. Pairwise-ranking, bean counter or matrix of criteria ranking are used as priority-scaling tools for deciding the urgency of each ideated activity and to calculate the resources at hand such as budget, human resources, building/crafting materials and others. The next stage of activities is the implementation in the field which comprises of scheduling, organizing,
technical planning, cost-spending, coordinating the tasks with the community and working together to realize the project (Figure 2).

5. Discussion
The sample of field implementation will be discussed by bringing the case study of FSRD UNS Design Culture laboratory project which is currently held in Delanggu District with a team consisted of students from visual arts master’s program and interior design undergraduate program, while also collaborating with lecturers and students across disciplines such as agrotechnology, civil engineering and architecture. Cross-disciplinary collaboration in any design culture projects is advocated to provide valuable inputs for various perspectives and system design concerning the community development project. This project itself is held to construct the potentiality of agriculture and plantations of Sabrang village in Delanggu district by also collaborating with the Association of Farmers Groups (GAPOKTAN) Sedyo Makmur as partner, teacher, and caretaker.

In the initial process, several visitations were made for introductions and conveying the intention while also explaining the program objectives and creating intimacy between the people involved by having meal together. Communal activities in the countryside could induce relaxing circumstances that connect people easily. Through light discussions, the farmers shared various experiences and ways of ecology-sustaining agriculture they had practiced in the past whose positive results brought pride amongst them. They conveyed their complaints for the modernized agricultural practices with short-termed planting methods and usage of various chemical agents that are damaging the natural ecosystems and yield less favorable produce. Surveys were also carried out by taking the walk around the village and in this process students actively inquired many things to the farmers and documented various discoveries.

![Figure 3](image_url)

**Figure 3.** Design culture laboratory UNS projects in Sabrang Village, Delanggu District

From the collected data, the mapping works of the village were performed using various tools while being guided by the farmers. The ideation process after the mapping was then performed using spider diagrams in several FGDs with the farmers (Figure 3, A). While considering the agricultural and plantation socio-cultural potentiality and how the surrounding natural environment can become a living partner, both systems and products were designed from various ideation groups with the outputs that supports this inter-relationship such as the Rojolele Delanggu pure rice strain replanting program to support the revitalization of biodiversity and traditional festivals, which is full of cultural values and better for the natural nutrient cycle of the land. This pure strain was nationally prominent but
unfortunately, it has not been planted on the land for approximately 30 years. In both rice-farming and plantation program much of the design concerns with regenerative aspect of the land and the people while also focusing on the circular economy through the added potential of agro-education and eco-tourism (Figure 3, B).

Currently, designing and coordinating processes with all collaborating academic society members, government representatives and the farmers were performed virtually on account of the worsened COVID-19 pandemic conditions. Notwithstanding these conditions, field implementation in both agriculture and plantations sectors was carried out by GAPOKTAN members alone, such as the replanting and building supporting infrastructures. Meanwhile, the students experimented with packaging design, polyhedral-structure design, and activity design such as eco-printing workshop, rice straw product design workshop, among others.

6. Conclusion
Design culture emphasizes experiential learning and thoughtful design practice through field studies and activities that place close attention and engagement to the local communities and natural environment. In the process, students/designers must always utilize their five senses when conducting surveys and be mindful in design processes. Through in-depth analysis related to the “treasures”, design culture practices have the objectives of maintaining cultural and ecological diversity of a region by making apparent the local potentials that can also serve as a communal identity, while its activities would trigger endogenous development that support environmental soundness, social acceptability, access to good quality education, the state of happiness, and responsible economic growth.

In Design Culture Laboratory UNS, activities have been carried out for students/designers to increase their sensitivity concerning the existing potentials, as well as learning to communicate and getting acquainted with the local culture which in turn, developing their aesthetic sensibility as well. Since the local people are positioned as teachers and main actors, they become the spirit that gives life and meaning to design. In the current activities held in Sabrang village, even local farmer groups took the initiative to provide fields for the development of rice-farming and plantation activities, and collectively moved to build simple infrastructures to facilitate the activities. In design culture term, this is the state of ‘another development sprung from within’. The local government also provides financial support and clearing areas designated as village assets for agro-education and eco-tourism. With an atmosphere like this comes a cooperative climate and collective ownership which is the key to community development. For environmentally sound community development to take root and becoming sustainable, maintaining awareness of the delicate relationships between the local communities and passive stakeholder such as nature is the key.

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