

PROCEEDINGS OF THE

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ON CREATIVE INDUSTRY 2017

CREATIVE EXPERIENCE IN DESIGN

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PREFACE

On behalf of the Organizing Committee, I am very pleased to welcome you to the 4th ICCI that is held in Surabaya, the capital of East Java that has known with the colonial building around the city.

The world we live evolved to the best form where experiences are well designed. Creative workers tend to push their work to the area that would result emotional respond. Many creators will dig deeper to find the way to impress the emotional side of audience. The 4th ICCI theme in 2017 is about how people in the creative area of industry develop the idea of engagement, touch point and measured effect of people in the social field, creatively. This area become a crowd junction that collaborate (traditional) creative field with other discipline such as cognitive science, architecture and environmental design, psychology, linguistics, theatre, information design, ethnography, brand strategy, interaction design, service design, storytelling, technical communication, etc.

We hope there will be fruitful partnership and collaboration following the enthusiastic discussion during the conference.

General Chair



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I. CREATIVITY AND EDUCATION

Creative Storytelling – Disseminating the Ideal City, Healthy and Accessible House

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Abstract – The urban environmental degradation become a current strategic issue because of lack of awareness. Young generation had important role to maintain the environment. And the awareness were to be nurtured as early as possible. The creative storytelling on the ideal - healthy city, especially related to healthy home, was very important activity to increase the awareness. A book storytelling with colourful illustrations were proposed in three elementary schools and one junior high school (for the blind). The method was found effectively increasing the understanding on healthy city. The *Kisah Kota Kita* (Our City Story) book, written by Dian Kusuma Wardhani and Watiek Ideo, contained 10 short stories, encyclopaedias, and unique facts about healthy city. After telling the story, the elementary school children were involved in the visual artistic activities producing drawing and small home models. Meanwhile for bridging the communication with children with visual disabilities, a healthy home model were produced. For the visual impaired students, the creative poetry writing was proposed to measure the understanding on healthy homes.

Keywords: *Community Service, Storytelling, Healthy and Beautiful City, Healthy Home*



1. INTRODUCTION

The world faced extreme environmental problems threatening its sustainability. The problems of resource depletion, global climate change, extinction of plants and animals, loss of wildlife habitats, increasing pollution, and poverty (Miller, 2003).¹ The urban environs were further deteriorated because of fast pace development that abandoning the environmental condition. The urban destruction became prominent also because of lack of environmental awareness.

The young urban residents actually had very important role to counter this. Positive values such of sustainable development and environmental awareness were needed to be nurtured as early as possible through family and educational institution. The awareness of healthy city had to be increased with effective and interesting method. The healthy city topic was less covered in schools' subjects, and the education methods were found less effective because of less appealing method, limited books and materials. A healthy and accessible home issue played a main role in the healthy city issue, because children observed and applied environmental awareness from their homes. Therefore the healthy home had be introduced with the interesting storytelling.

2. LITERATURE AND THEORY

Planning shaped cities, towns, regions, and even rural areas. It created vision for the community, identified current problems, analysed trends, engaged community members in dialogue about goals and issues, and sets the framework for growth and change. Planning ideally should involve all segments of the community. Aimed to shape cities purposes for health, safety, and well-being citizens. Planning was done in areas; transportation, housing, health, neighbourhood development, urban design, environment, disaster prevention. (<https://planning-org-uploaded-media.s3.amazonaws.com/document/What-Is-Planning.pdf>).²

The book *Kisah Kota Kita* (Our City Story), written

by Dian Kusuma Wardhani and Watiek Ideo, contained 10 short stories, encyclopaedias, and unique facts about environment.³ Storytelling with the book was selected because of colourful illustrations and stories that relate. The stories presented in the books were:

- Taman Cahaya (Parks with Lights),
- Jalur Populer (Popular Traffic Track),
- Toko Merah (Red Shophouses),
- Poster Heboh (Exciting Advertisement Signs),
- Titian Persahabatan (Friendship Bridge),
- Kantor Jingga (Orange Office),
- Stasiun Pelangi (Rainbow Train Station),
- Pasar Pagi (Morning Traditional Market),
- Festival Air (Water Festival),
- Pawai Sampah (Garbage Parade).

The illustrations of the book were found very interesting and easy to grasp by the children.

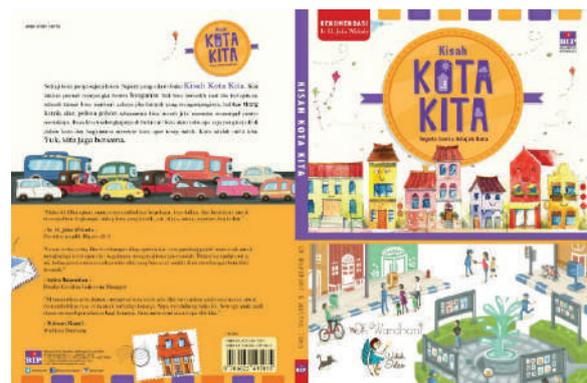


Figure 1. The book cover design, which was very interesting attracting the children to read the book.

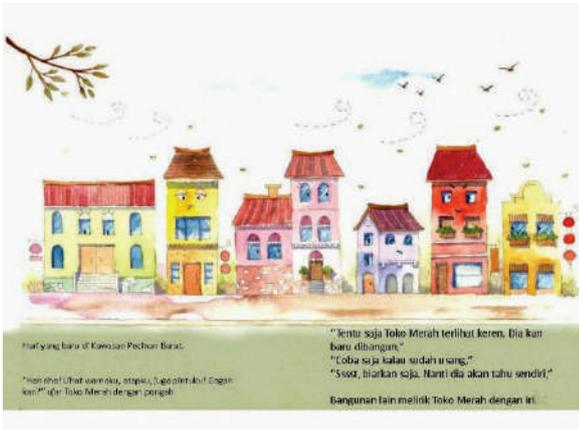


Figure 2. Sample of the book illustration on the Toko Merah (Red Shophouses),



Figure 3. Sample of the book illustration on the Taman Cahaya (Parks with Lights),

3. DATA AND METHODS

The book *Kisah Kota Kita (Our City Story)*, with 10 short stories was selected for the story-telling program. Story-telling were conducted in 4 schools with two different age of the audience. Three elementary schools and one junior high school (for the blind) were involved in the story-telling activities. The method was found increasing the awareness of the children on the topic. To complete story-telling, the elementary school children were later involved in the visual artistic activities producing drawing and small home models to measure their understanding on the topic. Total of 207 students were involved from the Kutisari 2 Elementary School (70 students), the Siwalankerto II Elementary School (75 students) and Siwalankerto III Elementary School (62 students).

Story-telling with YPAB junior high school children, was also conducted with creative method because of visual barrier. Two healthy home models were

produced by the undergraduate students in advance of the community service event. During the event, the junior high school children was told the importance of the healthy homes with fingering the home models. Later on, the creative poetry writing was proposed to measure the understanding on healthy homes. There were 30 visually impaired students and 4 visually impaired teachers involved in the story-telling process.

The program was prepared in 3 months, in collaboration Library @ Petra, Architecture Program and four schools and external supporting team. The activities were done by community service team consisting of 6 persons, and approximately 200 undergraduate students. The activities were held in 21st April, 22nd April, and 28th April, 4 hours each day. Some activities were described in the following pictures.



Figure 4. Welcoming speech from the Head of Library@Petra



Figure 5. The Interactions between students - participants.



Figure 6. The Result of painting workshop with elementary students



Figure 7. The Storytelling and reading a book “Kisah Kota Kita” together.



Figure 8. The Storytelling and reading a book “Kisah Kota Kita” together.



Figure 9. The Greeting by Gunawan Tanuwidjaja, ST. M.Sc. as the Leader of Community Service



Figure 10. The Storytelling and reading a book “Kisah Kota Kita” together.



Figure 11. Making 3D model houses together with elementary students



Figure 12. The Storytelling with assistance of 3 dimensional healthy home to the visually impaired students.



Figure 13. The Storytelling with assistance of 3 dimensional healthy home to the visually impaired students.



Figure 14. The Storytelling with assistance of 3 dimensional healthy home to the visually impaired students.



Figure 15. The Storytelling with assistance of 3 dimensional healthy home to the visually impaired students.



Figure 16. Handover of books and 3 dimensional architectural model for YPAB junior high school

4. RESULT AND DISCUSSION

These activities gave benefits to students to understand more on the health-ideal living city. The students became interested in taking simple green initiative caring natural environmental in health-ideal living city especially in their home setting. The students' imagination and creativity were also sharpened while creating 2 dimensional and 3 dimensional arts-craft on the healthy city and healthy homes. The visually impaired students learned on the spatial arrangement of the healthy home with 3 dimensional model.



Figure 17. Result of 3 Dimensional models created by elementary students and PCU students.



Figure 18. Reading of Poetry of Healthy Home created by junior high school students.

The teachers of elementary school and special blind junior high school received new books and arts-craft tools to teach the healthy city topic. They also learned in how to create fun and interesting educational event with environmental awareness material.

The activities were creatively delivered. Some technical obstacles were present such as group division of the undergraduate students and school children. The activities were liked by the principals, teachers and school children, because of the fun nature and insightful environmental issue. The community service team received input from the

principal and teachers that the interaction was actually too long because each school had different time arrangement, therefore it was recommended that the maximum time of community service program to be limited to 2 hours.

5. CONCLUSION

Library@Petra and Architecture Program Study felt the importance to develop the community service related to the literary and architectural aspect because of the urban environmental degradation. The involvement of young urban residents had to be developed with creative and fun methods. The creative storytelling on the ideal - healthy city, especially related to healthy home, was very important activity to increase the awareness. The *Kisah Kota Kita (Our City Story)* book was found suitable for the project execution. Besides the story telling, visual artistic activities and poetry making could be developed to enhance the students' material understanding and creativity.

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- Library@Petra
- Head of PPM Petra Christian University, Ir. Resmana Lim, M.Eng.
- Book Producers: Mrs. Watiek Ideo, Mrs Ika Aira Dewanto
- Supporting Team: Rachmad Priyandoko S.Sn., Ns. Tika Yulia Estuningtyas Widyastuti., S.Kep., Setia Rakasiwi S.Sn., Evanti Andriani Suwandi, ST, Mercyruth Manyakory
- Partner Schools:
 - Kutisari 2 Elementary School
 - Siwalankerto II Elementary School
 - Siwalankerto III Elementary School.
 - YPAB Surabaya (The Educational Foundation of Blind Children) Junior High School
- Architecture and Interior Students of PCU

7. REFERENCE

Dian Kusuma Wardhani & Watiek Ideo,(2014), *Kisah Kota Kita (in English: Our City Story)*, Bhuana Ilmu Populer, Jakarta

Miller G.T. (2003), *Environmental Science, Working With Earth*, 10th edition, Brooks/Cole Thomson Learning USA.

<https://planning-org-uploaded-media.s3.amazonaws.com/document/What-Is-Planning.pdf>



Representation of Character Education in Religious Theme Comic for Students of High School

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Comic Media is one of a visual media which is favored by teenagers. The discussion is focused on searching on the criteria of character education elements of local comic with education theme. The Result of this research points that comic with religious theme becomes a representative media in delivering the character education. The different style of the story tale and visual amongst the comic makers will make difference on the character education plots or contents in their works.

Keywords – character education, religious comic, representation

1. INTRODUCTION

High school is an advanced level institution whose a very important role in establishing student's character. Nevertheless, the full the schedule and non-academic activity they have, will lessen on the study which accommodate the elements of character education.

Basically, character education can be integrated with formal and non-formal education. In case, formal education contents academic stage (in school education), so the non-formal education is based on surrounding or self-experiences. Character education from this stage is popular media which is consumed by teenagers on high school level. Comic will be one of the case that is divided in to some genre. And, the religious comic is one of the consideration to be.

1. CHARACTER EDUCATION ACCORDING TO KHD

Educating method according KHD is called "education tools". He wrote in his book *Majelis Luhur Persatuan Siswa (Students Association Assembly Sublime 1977:28)*, focused on:

- a. Instantiating (*voorbeelt*)
- b. Habituation (*pakulinan, gewoontevorming*)
- c. Teaching (*wulang-wuruk*)
- d. Behaviour (*zelfbeheersching*)
- e. Life Experience (*nglakoni, ngrasa*)

According to what has been presented by Ki Hadjar Dewantara about character education, there are 18 values in the development of cultural education and the character of the nation created by Diknas. These values can be seen in the table below (Training Material for Strengthening Learning Methodology Based on Cultural Values to Establish National Competitiveness and Character, by Curriculum Center of National Education Department, 2010).

Values in the Development of Cultural Education	
1. Religious	10. Spirit of Nationality
2. Honesty	11. Love the homeland
3. Tolerance	12. Achievement Appreciation
4. Dicipline	13. Friendly / communicative
5. Hardworking	14. Peace loving
6. Creativity	15. Likeability to read
7. Independency	16. Environmental caring
8. Democratic	17. Social caring
9. Curiosity	18. Responsibility

Figure 1. 18 Values in the Development of Cultural Education

2. RESEARCH METHODS

Implementation of the study will go through several stages, among others:

1. Introduction Study Stage

This stage aims to add data / references on various matters relating to character and comic education. In the preliminary study conducted among others through literature studies and existing studies.

2. Selection phase of the case study

Researchers will select some comics in which have the material in accordance with the needs of research.

3. Case Study Observation Stage

In this section the researcher will observe the comics that have become the case study. The elements to be studied include the representation of character education (based on 18 character education items), and the method of character education in the comic story (based on 5 ways of character education). The results of the observations will be presented in the form of elaboration and quantitative accounting.

4. Post-test stage and FGD with high school students

This stage will be mapping prospective respondents based on the genre and target market that has been determined. Post-tests in this section were conducted to test students' awareness of character education in comics to be compared with previous observations.

5. Evaluation Stage

The activity at this stage is to examine the results of the observations and post-tests that have been done. The main purpose is to understand how the elements of character education are communicated and understood through comic language.

In this study, the objects that become the unit of analysis are some comics by

Vbi_Djenggoten and SQU. Total comics to be analyzed as many as 6 comics, namely:

- 33 *Pesan Nabi Vol 1*, karya Vbi_Djenggoten (penerbit Zahira, 2013)
- 33 *Pesan Nabi Vol 2*, karya Vbi_Djenggoten (penerbit Zahira, 2013)
- 33 *Pesan Nabi Vol 3*, karya Vbi_Djenggoten (penerbit Zahira, 2014)
- *Islam Sehari-hari*, karya Vbi_Djenggoten (penerbit Qultum Media, 2016)
- *Pengen Jadi Baik Vol 1*, karya SQU (penerbit Zahira, 2014)
- *Pengen Jadi Baik Vol 2*, karya SQU (penerbit Zahira, 2015)

3. CHARACTER EDUCATION FREQUENCIES AND DELIVERY METHOD

An analysis of the total number of character education in the six comics that became the case study, was conducted to determine the frequency of the appearance of the character education value in the comics. The interpretation stage is done at each end of the story in each story

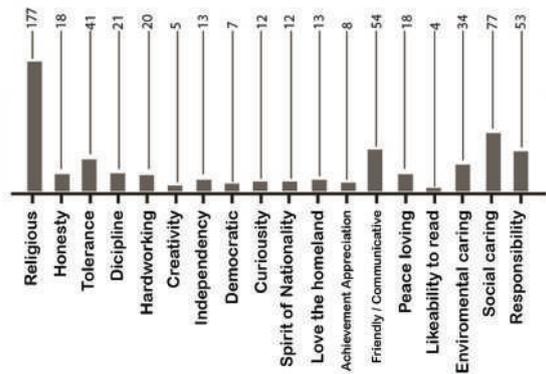


Figure 2. Total Number of Character Education in the Six Comics

From Figure 2 it can be seen that from all the educational comics the most widely used character is religious with the frequency of 177 occurrences. The other character education most commonly found in every comic is social concerning with the frequency of 77 occurrences. As for the education fond of reading, creativity, and democratic characters have the least frequencies of 4, 5, and 7 respectively.

The analysis of the delivery of the six comic books into the case study aims to know the frequency of delivery in each comic book in relation to character education.

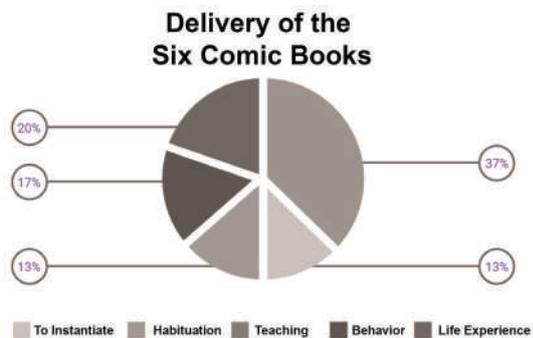


Figure 3. Frequency of Delivery in Each Comic Book

Seen in Figure 3, that of the six comics that have been analyzed the most submitted way is ‘to instantiate’ with percentage 37%, followed by life experience as much as 20%. Furthermore, the way of delivery with the behavior as much as 17%. Then the way of delivery with teaching and habituation has the same weight percentage that is equal to 13%

4. COMIC LANGUAGE ANALYSIS

a. Punchline

The comics that became the object of research have a similar way of expressing the same in showing punchline, that is the passage of hadith or holy verse at the climax or the end of the chapters. The average punchline is present as a solution or answer to the problem raised. But in some chapters, the passage of hadith or holy verse actually appears in the prefix of the chapter, where the next story is a description or depiction of everyday life.

b. Genre

The genre used in the comics is humor. The whole story is presented in the form of a short bunch, trying to raise the message in the form of a parody of everyday life.

c. Storytelling

Broadly speaking these comics tells the story of

everyday life that is presented in the form of pembabakan. The number of each chapter varies from 1 to 20 pages, depending on the complexity of the story.

There are several differences in style between the two comic artists. In the story presented in the works of VBI_Djenggoten, the way of speaking is dominated by giving examples of the context of the main story or premise. So the coherence between stories (chapters) with each other is often unrelated, although some characters experience repetition of occurrences. This is different from the SQU story telling style based on the personal experience of the comic artist. So the coherence between stories (chapters) presented according to the timeline of events.

d. Characterization

The comics are both utilizing certain characters as the main messenger. However, there are striking differences between the characters in the comic works VBI_Djenggoten and SQU.

Comics VBI_Djenggoten use more characters by adapting the daily stereotype as messenger. Example; Pak Haji, Police, Street vendors, housewives, students, office workers, and so forth. But there are also some stories that feature VBI and family as its main character. In some stories, the characters appear repeatedly, according to the role of the character as a messenger.



Figure 4. Example of the comic styles compared to VBI_Djenggoten and SQU

SQU comics tell more about personal experiences, using comic characters and family as the main message introduction. The development of characters around the characters of the comic, adapting to the needs of the story and the premise of the story in question. The SQU avatar figure as

"Abah" is the primary character who acts as the primary messenger.

e. Style of Drawing

The comics use the cartoon style of drawing. The most dominant style differences of the two comics are seen in the distortion of human posture. In the VBI_Djenggoten comic, the head size of each character appears to be deliberately larger than the body size. While in SQU comics, the proportion of humans still appears to follow a realist posture. Both comic artists consistently eliminate the depiction of the nose on the face. The stroke (edge line) used by VBI also appears thicker than the SQU image.



Figure 5. Example of the comic styles compared to VBI_Djenggoten and SQU

f. Panelling

The dominant viewpoint used in these two comics is the point of view of the human eye. The bird's eye angle is only used to describe large areas, and the frog's eye angles are used in some action scenes. The dominant visibility is the medium shot and close up. Many climactic scenes are placed at the end of the round in large panel sizes or 1 full page.

5. POST-TEST AND FOCUS DISCUSSION

This section has been done post-test and Focus Group Discussion (FGD) involving selected high school students, to find out how the content of character education in comics is understood by them. The comic that became the case study was "33 Messages of the Prophet Volume 1" by VBI_Djenggoten.

The number of respondents used in this study were 41 respondents who came from students of SMK Muhammadiyah 2. Where the students were asked to identify the character education and delivery method is the most effective on comic 33 Messages of the Prophet Vol.1. The respondents of the students of SMK Muhammadiyah 2 are on average 17 years old with the number of 26 people, while the number of people is slightly 18 years old with 6 people. So about 50% of the respondents students SMK Muhammadiyah 2 is 17 years old while 50% of others spread at the age of 16 years and 18 years. The gender ratios in this study are equally balanced between male and female respondents. Male respondents amounted to 21 students or 51% and female respondents amounted to 20 students or 49%.

The FGD was held at the Building Design Institute of Sepuluh Nopember Technology, inviting approximately 50 students from animation and multimedia majors. The background of respondents is considered appropriate because the students have enough experience and competence in the field of visual design, storytelling, and communication. This is evidenced by almost all of them having no difficulty in understanding the topic of the study, and identifying the character education content that becomes the object of research.

Questionnaire results relating to content analysis, did not show significant differences with the results of the researcher's analysis. Students can identify and categorize character education content well. The difference lies in the understanding of the way the delivery is used in comics. If the results of the analysis of the researcher more recognize the way of delivery by giving an example, the results of the questionnaire indicate that the more students recognize the way of delivery with behavioral examples.

Overall they think comics are an effective medium in conveying character education. Almost all respondents stated that they easily understand the content of character education in the comics that became the case study. The most effective way of delivering them according to them is to set an example. This is because, by way of delivery is to make the story in the comics more interesting and varied. Because the plot in

the story becomes more diverse, it depends on the character's educational grain to be delivered.

6. CONCLUSION

From the analysis and research results Representation of Character Education In Comics can be concluded, among others:

1. Character education delivered through selected comics, delivered in different ways, depends on the context of the story and characterization. The way of delivery by giving examples and inner-born experiences is considered to be quite effective in the delivery of character education.
2. The narrative or story aspect used in conveying character education points uses several approaches, including packing stories in the form of humor and containing snippets of everyday scenes commonly found around the reader's life. The story is also adapted to the passages of Scripture or Hadith to be lifted.
3. Storytelling delivered through comic media becomes more easily accepted and understood by high school students, because it contains things that are close to everyday, interesting in narrative and visual, do not seem patronizing, and teaches the value of the good that can be universally understood.
4. The comic artist or comic artist has its own way and style of storytelling in communicating through his work. The difference is not only about the style of the image, but also includes the way of telling and determining the storyline. There are two different dominant methods of delivery to the comics that are the case studies in this study, which provide examples and experiences of inner birth. The way the delivery gives an example has a broader aspect and scope, because the elements of characters and narrations in it always adjust the message to be delivered. While the way of delivering the inner-born experience has an advantage in detail and the closeness of the story, because what is conveyed is a personal experience of the comic artist.
5. Comic comics, each of which is a compilation of short stories with a religious theme. The majority has a light story theme and is appropriate for segmentation of high school students. But there are also some

stories that are more appropriate for the adult segment, although the number is not too much.

6. Each comic that becomes a case study, contains all the values of character education in different portions. But also found other virtues that are not included in the 18 values of character education. For example; Humility, simplicity or unfashionable luxury of life, fortitude and patience, generosity, good prejudice, and also ethical etiquette.

7. SUGGESTION

The use of Comics as a medium of character education teachings proved to be effective for the segmentation of Upper Secondary Students. But there are some theme stories that are too heavy and mature, although still acceptable and understood by students. Therefore, the genre on the comic should be re-adjusted based on the targeted target segment.

Theories about character education that adopt more of Ki Hajar Dewantara's thoughts also need to be developed and combined with broader discourses, such as customary norms, karmic rules, and universal good. So enrich the aspects that can be studied on the comic itself.

8. SUSTAINABILITY PLAN AND FURTHER IMPLEMENTATION

This research is the first step to study the broader aspects of media. If the comics used in this study are local religious genre comics, the future is expected to be performed on local comics with other genres (action, romance, humor, etc.). Even did not close the possibility can be done studies on imported comics circulating in Indonesia. Character education elements can also be developed by referring to other good content, such as norms, manners, customs, and so on.

The results of this study can also be implemented by the design practitioner, to produce works that contain character education content, either comic media, or other media based on storytelling (animation, film, children's story books, etc.)

REFERENCES

McCloud, Scott, 1994, *Understanding Comics : The Invisible Art*. William Morrow Paperbacks

Koesoema A, Doni, 2007, *Pendidikan Karakter: Strategi Mendidik Anak di Zaman Global*, Grasindo, Jakarta

Haryanto, 2010, *Pendidikan Karakter Menurut Ki Hadjar Dewantara*. Kurikulum dan Teknologi Pendidikan FIP UNY

Ki Hadjar Dewantara. *Bagian Pertama: Pendidikan*. Yogyakarta: Majelis Luhur Persatuan Taman Siswa. 1977.

Pusat Kurikulum Departemen Pendidikan Nasional, 2010, *Bahan Pelatihan Penguatan Metodologi Pembelajaran Berdasarkan Nilai-nilai Budaya untuk Membentuk Daya Saing dan Karakter Bangsa*

Winarno Surakhmad, dkk. (2003). *Mengurai Benang Kusut Pendidikan*. Jakarta: Transformasi

Design of Education Media For Disaster As Awareness of Life Space In Disaster Area

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Abstract — The visual communication media produced for disaster education has been widely developed, both by government and independent agencies working on a voluntary basis. This study aims to identify, understand and explain the study of visual content on disaster education media in the strategy of transmedia. Some of the educational media that have been developed utilize the approach of local people's speech culture such as through songs or people's games, but it is not known how well the public understanding of the emergency situation when the disaster occurred.

The research method applied is grounded theory with qualitative descriptive analysis. Grounded theory is a qualitative research design in which the researcher generates a general explanation (theory) about the process, action or interaction formed by a number of participants.

Technological developments close to the user allow opportunities to take a role in disaster and mitigation education. The research will trace the formal aesthetics of educational content design on disaster mitigation as a disaster education effort through various possibilities in communication approach through visual language in disaster education.

Keywords – *i.e. disaster mitigation, education, transmedia storytelling*

1. INTRODUCTION

The intersection of the Eurasian Plate, the Pacific Ocean Plate and the Indo-Australia (ring of fire) causes some areas in Indonesia to have potential earthquakes both tectonic and volcanic as well as the potential for periodic tsunamis. These conditions make natural disaster events almost become a routine. In the face of such conditions, the need for education for the community to mitigate (anticipatory efforts to minimize the impact of disasters) is effective. In the AKMB (Direction of Disaster Mitigation Policy) issued by the National Coordinating Agency for Disaster Relief and

Refugee Management in 2002, one of the key issues in disaster management is socialization. This directive focuses on the socialization of disasters, their impact on the environment / community, and disaster mitigation activities, especially on people living in disaster susceptible areas.

Disaster management can start from the pre-disaster stage. Awareness of hazardous living spaces will provide the ability to anticipate and respond appropriately in case of disaster. This educational media is socialized to the community but the extent to which cognitive impacts are given is unknown. In addition, many educational media that has been distributed

online and can be accessed anytime. Psychomotor aspects and community empowerment are generally provided through training, workshops and simulations in kelurahan and schools in disaster susceptible areas. This research attempts to identify, understand and explain about visual aesthetic studies on disaster education media in various strategies of transmedia. Disaster education differs from general education because its communications products should receive attention, closely related to emergency situations and safety related information closely linked to communication culture of a community.



Figure 1. Cycle of disaster and Disaster Management (Rachmat, 2006)

This study aims to identify, understand and explain the study of visual aesthetics on disaster education media in various strategies transmedia. The impact of the research is expected to (1) provide an adequate explanation of disaster education related to the characteristics of Indonesian people's living space (2) encourage the creation of problematic creative content related to disaster education in indigenous Indonesian communities with Visual Communication Design approach; (3) to achieve the transfer of knowledge and technology from universities and R & D institutions to business and industry entities or vice versa in facing the nation's problems related to disaster education; (4) to promote the concept of disaster education in competitive product development, innovation and high technology Sustainable.

Researchers are trying to understand how various parties have been designing disaster education media whose content generally lifts the symptoms of disaster and how to avoid the risk of fatal (mitigation). Educational media will have a strong impact when synergized with other methods such as disaster simulation or strengthening community capacity in the face of emergency. It is expected that effective strategies for disaster education will be sourced from the typical geographical conditions of Indonesia according to the characteristics of disasters faced by communities in disaster-susceptible areas and local wisdom

Researchers assume that all media communication in disaster education has been designed with good consideration. Although not yet comprehensive, some media have involved professional designers to design the media. From preliminary data in previous studies, it was found that the existing media only responded to seasonal calamity cycles, so that life skills in the face of disasters were more disseminated through certain family or community systems through a cultural perspective. Researchers propose the ineffectiveness of disaster education media related to aesthetic aspects of visual communication that make educational messages less understandable, or appealing to people living in disaster areas. Researchers also suspect that these aspects will be socio-geographically linked so that the message is site specific.

2. LITERATURE AND THEORY

2.1. Disaster Management

During this time disaster management is considered not a priority and only come at any time, when we live in areas susceptible to the threat of disaster. Disaster Management aimed at (1) preventing loss of life; (2) reduce human suffering; (3) providing community and authority information on risks, and (4) reducing damage to key infrastructure, property and loss of economic resources (Rachmat, 2006: 3). Cultural variations from one place to another make approaches in earthquake-handling planning different across cultures. Communities that are geographically living in disaster areas generally have traditional disaster-hungering

plans. Patterns in a community and social group can influence patterns of relief. Different cultural groups have different beliefs about the concepts of death and life and often respond to a disaster phenomenon in a way unpredictable to modern people (Ehrenreich, 2001). The amount of disaster education media is sometimes opposed to the traditional concepts that have been experienced by the community in the disaster area. Visual language used in message communication in disaster education has aesthetic aspects that can be studied further so that it can provide a theoretical framework for its application in the realm of praxis.

2.2. Transmedia Storytelling

"Transmedia storytelling" is a cross-story and diverse media, as audience participation, interaction and collaboration occur (Pratten, 2011). In Transmedia storytelling, bonding with the audience can influence the success of audience understanding, stories can be enjoyed and lived. Transmedia storytelling unfolds across the various media platforms where each created text becomes unique and makes a valuable contribution to the whole (Jenkins, 2006). Media is one of the aspects that need to be considered in the dissemination of knowledge to provide education related to disaster. Utilization of Information and Communication Technology provides opportunities for mass and simultaneous dissemination. Some alternative efforts have also been taken by disaster crisis management agencies. Education in communities living in earthquake susceptible areas can start early.

3. DATA AND METHODS

The method used in this research is grounded theory which is a research tool to find, understand and conceptualize the latent social patterns in society and help form the structure of understanding of the observed area to form an inductive understanding of the data obtained, then to the stage of composing theories that help guide the subsequent collection of data and subsequent research questions. This deductive stage in Grounded Theory will help determine the major categories of research in order to elicit a new theory. Grounded theory is a qualitative research design in which researchers elicit a general explanation (theory) of processes,

actions or interactions formed by a large number of participants (Creswell, 2015: 115). The research method applied is descriptive qualitative with various possibilities in communication approach through visual language related media content. In grounded theory, the purpose of this stage is to enable the establishment of important aspects of the data that has been collected. Design variables to be studied in this research include: (1) media used in transmedia storytelling method, (2) aesthetic aspect in visual design which include :, layout, color, icon, typography, animation and illustration, (3) Content aspects, related to character design, interactivity and media message design that is sufficient to provide understanding and education to the audience. In grounded theory, the stage of conception in which data can be grouped according to a particular concept. The acquisition data comes from a variety of media range from posters, games, visuals, animations, and comics. The final stage of this series of studies is categorization. Categorization of data will provide the possibility of data in groups that are broad enough but have similarities to be categorized and observed from a particular theory.

4. RESULT

The study of each media according to the variable is in the tables as follow:

Table 1. Sample 1: web comic

Media	Design Variable	Content
 <p>Komik online edukasibencana di portal KamensISDM www.portal.vsi.edu.go.id/soemial Internet page comic</p>	<p>Composition generally uses the composition rules in the comic panels with emphasis on some enlarged panels with the shot-shot technique Colors use manual staining techniques and tend to resemble children's coloring styles to match the group of readers Text typography supports narrative stories with very little balloon dialogue Illustrations using children's drawing styles with a proportion of child anatomy are also reinforced with a simplified disaster landscape No sounds code</p>	<p>Character design aimed at elementary school children of early age where the ability to read not too good so that the message is designed by using the character as a messenger, raised the characters of children who are full of curiosity on natural phenomena Process diagrams are displayed in several panels to make it easier for the audience to understand the message, such as the earth layer diagram or the process of the occurrence of a disaster</p>

Table 2. Sample 2: website

Media	Design Variable	Content
 <p>Website Aliansi Kementerian Perikanan Kelautan dengan info-info kebencanaan www.coomap.or.id Web page</p>	<p>Composition utilizes a three-column website layout with main content in larger proportions in the middle and navigation on the left side Color The scheme of blue-gray becomes the color emphasis to assist navigation while the white-colored content field Typography utilizes a palette of webfont that has good legibility Illustrations in the header section show underwater photos, while articles are tailoring content No sound code</p>	<p>Interactivity points and clicks like the web in general with the control of information in the hands of users Accessibility of articles that can be searched based on keywords or as a timeline</p>

The result of analysis from information media and education of disaster was taken randomly. The subjects in table 1 to table 5 are media developed by government agencies and public

institutions related to disaster in Indonesia. The language used is the Indonesian language so that the group that is expected to consume information and educational disaster is the people who speak Indonesian.

Table 3. Sample 3: Smartphone application

Media	Design Variable	Content
 <p>Apresiasi Sisa Bencana dikembangkan PMI (playstore)</p> <p>Smartphone application on PlayStore (5000+ downloads)</p>	<p>Composition uses linear compositions with several icons to emphasize accessible information</p> <p>Colors are predominantly white with red accents on icons and some text for legibility and emergency situations</p> <p>Typography of text from a palette of letters without hooks that have high readability</p> <p>Illustrations apply only to icons and a few pieces of photograph to illustrate a disaster condition</p> <p>Sound codes are responses to the accessed icons</p>	<p>Interactivity in the content gives the user the opportunity to test how well understanding the disaster in the quiz-like menu. Users can also report on nearby emergency situations. There is also menu info about standby flag</p> <p>Icons are designed in large size on the main menu screen with key info related to tsunamis, floods, earthquakes, hurricanes and alerts. Users are asked to fill in the location of residence at the beginning of the application usage to facilitate the delivery of geographically relevant information</p>

Table 4. Sample 4: Game Application

Media	Design Variable	Content
 <p>Game AkasArbini (web game)</p> <p>Game Application</p>	<p>Composition grid-shaped consisting of icons from the objects that related to safety in emergency situations</p> <p>Colors use a tropical color palette according to the game distribution area</p> <p>Typography Headline is game titles and game related information in the latched palette of letters</p> <p>Illustrations use an iconic image style with opaque color technique applied</p> <p>Sound code: There's sound response on icons, background sounds and comments / responses on player performance</p>	<p>Interactivity in the content gives users the opportunity to collect items related to emergency disaster situations (understanding this item is a life skill living in a disaster area)</p> <p>The in-app icon is designed in an animated 4x3 grid layout as well as a hand-held pointer associated with picking and collecting activities</p> <p>Gameification are required to fill the standby bag according to the requested item and different bag capacity</p>

Table 5. Sample 5: sticker

Media	Design Variable	Content
 <p>Sticker Fujaira UNPD Jawa Barat</p> <p>Sticker distributed after socialization in group of settlement</p>	<p>Composition Symmetrical and left-right flat (justified)</p> <p>Color The text uses primary & secondary colors with white outline. The colors on the background in the form of photos are less contrast when placed behind the text</p> <p>Typography has no consistency of palette options, tend to utilize shades that are available only</p> <p>Illustrations: using landscape photography related to the message delivered</p> <p>No sound code</p>	<p>Verbal messages are an appeal to better prepare for or prevent disasters that are packaged as campaigns. Because it is combined with other media (eg posters, simulations or cartoons) the content of messages in this medium is less information that directly related to disaster.</p>

Table 6. Sample 6: Graphic Science series

Media	Design Variable	Content
 <p>Ramli Mas Bolemi Agneska Shalip, Chynda Martin dan Bill Anderson</p> <p>Graphic Science series</p>	<p>Composition generally uses the composition rules in the comic panels with emphasis on some enlarged panels with the shot shot technique</p> <p>Color uses digital coloring techniques with contrasting colors, the light with the highest intensity and the shadow appears to reinforce each other</p> <p>Typography texts support narrative stories with dialogue balloons and narratives according to the density of the story</p> <p>Illustrations using the American comic style drawings in general with thick outlines and dramatized coloring according to the demands of the manuscript, many also depicted landscapes with dramatic coloring</p> <p>No sound code</p>	<p>Character design The main character is a scientist who possesses superpowers, portrayed in the heroic proportions typical of the American superhero comic character. This ship explains the natural process of disaster with simple language and takes the example around the target audience (middle-aged children)</p> <p>Script is designed on the basis of experience of the main character as a scientist who describes every natural phenomenon</p> <p>Process diagrams are displayed in several panels to make it easier for the audience to understand the message, such as the earth layer diagram or the process of the occurrence of a disaster</p>

Table 7. Sample 7: web-based Animation

Media	Design Variable	Content
 <p>Animasi oleh FEMA USA</p> <p>Animation from FEMA USA account on Youtube</p>	<p>Composition generally uses the rules of composition in animation that refers to the cinematography where the screen as space revealed. Generally objects are emphasized like floodlights or emphasis on certain colors, as well as long-in-close-up games</p> <p>Colors use the blue palette as the dominant color in almost every series as well as the color of the identity of this campaign. Other colors present as accents on the overall look</p> <p>Typography text is used in the title (all the titles are related to the phenomenon of a natural disaster) and are used to emphasize information (eg help hotline)</p> <p>Illustrations using vector image styles with simplified, minimalist but informative portrayals of objects</p> <p>Sound code The narrator's narrative reads the script and emphasizes the sound effects (natural / artificial Foley) in certain sections</p>	<p>Character design Simple design with gestures that are easy to understand also have a distinctive style in each series that appears. Details on the face and hands are removed so that it can mean anyone</p> <p>Verbal messages are displayed as symptoms shown by nature prior to the occurrence of a disaster, what to prepare, what actions need to be prioritized and how to ask for help</p>

The subjects in table 6 are media from outside Indonesia translated into Bahasa Indonesia. The events and natural phenomena in the series do not necessarily refer to what happens in countries with geographical features such as Indonesia. The subjects in tables 7 and 8 are a channel on Youtube

related to education of children belonging to organizations outside Indonesia and disseminated in English.

Table 8. Sample 8: Education movie

Media	Design Variable	Content
 <p>Crash Course Kids (Channel Edukasi PBS Digital Studios, USA, disebarkan di Comikidly)</p> <p>Film and motion graphic: from PBS account on Youtube</p>	<p>Composition generally uses the rules of the film's lower compositions with reference to cinematographic techniques in which the screen is the mise en scene. Consisting of a live shoot part of a narrator and an animated explanatory section that alternates appear as a script</p> <p>Colors use a pastel-color palette that lifts natural colors (blue, green, brown) with adjustments to specific content</p> <p>Typography Text is used in titles that mark information segments (all titles are related to the phenomenon of a natural disaster) and are used to emphasize information (eg, a brief definition of a phenomenon)</p> <p>Illustrations using vector image styles with simplified, minimalist but informative portrayals, cartoon personification of nature (eg clouds and mountains of dialogue)</p> <p>Sound code The narrator's narrative code reads the script and emphasizes the sound effects (natural / artificial Foley) in certain sections</p>	<p>Character design The main character is a narrator who explains natural phenomena in a funny way, interacting occasionally with animated content through motion graphic techniques. The narrator is also described as an animation that can interact with the subject being described.</p> <p>Verbal messages are packaged as short courses, so narrator always gives information about everyday phenomena that the audience faces, then explains it in simple language, from the symptoms, how it happens. In the end of movie session is always given a conclusion</p>

Table 9. Media Categorization

Sample	Media	Language	Presentation Technique	Target audience
Sample 1	Web-comic	Bahasa Indonesia	Visual domination	Early children (6-10)
Sample 2	Website	Bahasa Indonesia	Text domination, bto miniyang tampil hanya pada artikel	Adolescence (15-1)
Sample 3	Smartphon application	Bahasa Indonesia	Text domination, foto sebagai penjeias tiap subyek	Adolescence (15-1)
Sample 4	Games application	Bahasa Indonesia	Visual domination with interfection	Pre adolescence (12-17)
Sample 5	Sticker	Bahasa Indonesia	Visual domination and static text	All ages
Sample 6	Graphic Science series	Translated from English	Visual domination and static text	Pre adolescence (12-17)
Sample 7	Web-based Animation	English	Visual domination with motion graphic	Pre adolescence (12-17)
Sample 8	Education movie	English	Visual domination combine film and animation	Pre adolescence (12-17)

5. DISCUSSION

ACKNOWLEDGMENT

Samples taken in this preliminary study show a diversity of approaches, both visually and verbally. In addition to the language approach used, the target audience that is widely served in education and information disaster is the middle-aged children. This conclusion is drawn from the visual styles used and the complete information given. In addition, the approach to the audience tends to be dominated by more visual language with colors that are popular among these ages. Sample number 6, 7 and 8 have the transmedia storytelling that well designed for the specific audiences.

REFERENCES

Book

Creswell, John W. (2015). *Penelitian Kualitatif dan Desain Riset*, Edisi ke-3, Pustaka Pelajar, Yogyakarta

Ehrenreich, John H.(2001). *Coping With Disasters: A Guidebook To Psychosocial Intervention (Revised Edition)*, Sharon McQuaide, M.S.W., Ph.D. Clinical Consultant

Pratten, Robert (2011). *Getting Started with Transmedia Storytelling*, ISBN: 1456564684, ISBN-13: 978-1456564681

Stine Schmiege Johansen (2014). *Content Potentials in Transmedia Storytelling*, The Faculty of Humanities and The Department of Communication and Psychology, Aalborg University.

Article in a published proceedings

Lakoro, Rahmatsyam (2011). *Icon Recognition for*

Graphical User Interface of Disaster Life Skill Game through Pattern Recognition with Fault Tolerance, International Conference of Revisited Asian Society, Yogyakarta

Report

Rachmat, Agus (2006). *Manajemen Dan Mitigasi Bencana*, Badan Penanggulangan Bencana Daerah Jawa Barat

Composition Two Dimensional of Patra as Taste the Sensitivity on Basic Design

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Abstract - Basic Design or better known as Nirmana is a course includes every turn of the curriculum on the campus of Indonesian product design. Nirmana is basically the eye elementary lectures that provide stimulus to students to be trained sensitivity to senses elements of visual elements that are at the core of the art and design disciplines especially regarding aesthetics. As a stimulus, nirmana has a variety of exercises given to students. The most exercise commonly done is the processing of formalistic elements dwimatra, Formalistic elements of the form of design: point, line, field, volume, color processed and developed by looking at the perceptual element. Perceptual elements often vary in their appreciation and evaluation. Call it Composition which became one of the perceptual elements in nirmana. Compositions are often assessed in angles different viewpoints, especially the evaluators look at the subjective and make tidiness as a determinant of good value or not. Though Composition is a dynamic element and have tendency according to the taste process of the manufacturer. The composition of the form in the nirmana basic design have different tendencies for each student until in this research the pattern and the tendency of the composition in the nirmana of the design will be mapped again by looking wrong a student assignment on dwimatra composition. The purpose of grouping such compositions is seen how the process of taste from students so that the evaluator does not just respond to the work subjectively, but can be felt deeper approaching objectives

Keyword :Nirmana, visual element, patern of composition, two dimensional

INTRODUCTION

Curriculum Product design in Indonesia includes basic design as the main course in the first year. The basic courses of design on the campus of product design in Indonesia range from its designation, nirmana or pramana. Nirmana lecture is divided into two stages namely Dwimatra and Trimatra. Though the two-dimensional touch with sense and sensibility two-dimensional visual elements. While trimatra continue the principles on dwimatra applied to 3-dimensional objects.

According to John Dewey (2009: 217-218) sport is the basic level to gain design experience. The design experience shapes the psychological and emotional experience to reinforce the designer's impressions especially

with regard to aesthetics. The experiences in nirmana are part of the sport as well as art, among them: (1) graphical experience (sports / drawing), (2) experience of arrangement (design / design), (3) psychological experience (appreciation), and (4) chromatic experience (color).

Nirmana Is the organization or preparation of visual elements such as dots, lines, colors, space and texture into a single composition of the harmonious. can also be interpreted as the result of wishful thinking in the form of dwimatra (2D), trimatra (3D) which must have a beauty value. also known as basic science (Sanyoto, Sadjiman Ebdi, 2005).

Like fine art, nirmana as the basic course of product design is a stimulus to taste the

aesthetic formers. For some individuals the aesthetics are viewed as subjective and difficult to measure in evaluation and planning. Some other individuals view aesthetics as beauty that is created by itself. Basically aesthetics in the world of product design created from all aspects of the designer namely; function aspect, market aspect, technological aspect, production aspect and aesthetic aspect itself. On the aesthetics if necessary understanding and processing of visual elements dalam of product design. According andry M unexploited (2010) are the visual elements of the design of products that can be processed to produce a product with a better aesthetic value. The visual elements consist of formalistic elements (points, lines, idang, volume, color, etc.), perceptual elements (composition, rhythm, proportion, direction of motion, harmony, etc.) and a material element [3]. These visual elements are studied in an experience sequence in basic design nirmana lectures.

Nirmana is not functionally oriented but in visual perception. In line with the perceptual element of the visual design strategy of the product then the elements associated with visual perception are more trained and processed in the nirmana lecture. One of the perceptual elements that is often trained is composition. The composition provides a significant experience in aesthetic formers.

In the first stage the design base focuses on dwimatra. To obtain nirmana dwi matra usually starts from the manufacture of basic geometric objects such as square, circle, triangle, pentagon, hexagon and other basic shapes including organic forms. The basic shape is then arranged and arranged in such a way that it forms a pattern. Patterns and shapes of two-dimensional nirmana generally produce a good composition and composition appropriate gestalt theory is patterned and has elements: unity, balance, proportion, rhythm, and emphasis. Practicing good composition enhances the sensitivity of aesthetics where aesthetics are created from beauty and according to gestalt beauty can be created because of unity and harmony whereas according to Vitruvius beauty occurs naturally to an agreement and uniformity.

In addition to special treatment in the student's sporting experience, other problems in

basic design lectures are the apresiator and evaluator difficulty in determining the composition factor. Nirmana's tasks are often judged in line with the experience and emotions of his evaluators. The experience and emotions of the evaluator become the benchmark of determining the value and neatness of the workmanship to be the critical success factor. There are other factors that should be assessed in the application of the nirmana Works composition. Application of Composition in works of nirmana has a tendency that varies each individual. Application of the composition forms special patterns that can support visual perception. Pattern patterns are associated with elements of unity and harmony that can further lead to the beautiful work according to gestalt. In this study the evaluation of dwimatra works are grouped into several categories according to unity. Grouping of works analyzed its characteristics which then used as a reference in evaluating the work dwimtra.

In a study of art and design (Prentise, Roys, 2002; p. 16) should be not about right and wrong but rather to stimulate the experience of several exercises that take place continuously accompanied by undestanding creators self impression.

METHODS

The basis of product design in this case nirmana dwimatra associated with visual imaging in the form of two-dimensional patra. One of the dwimatra tasks given for composition processing is the task of geometric patra composition. This task is the first task in processing the composition of geometric shapes. Before carrying out the exercises in the form of student duties described the basic pronsip dwimatra masterpiece in which the work should be understood and accountable even if not related functions. The basic principles of dwimatra's work are: (1) Unity (unity); is one of the most important basic principles of art. According to gestalt unity is a very important basic principle to produce aesthetics with a particular message. In unity / unity patra berkesi let has a pattern that Erai ter nambungan and not scattered. In appreciation of the work by seeing unity should be comfortable to be seen and

enjoyed. (2) Sustainability (Balance); balance is almost immeasurable but can be felt. (3) Proportion; proportion focuses on comparative field or area comparison. (4) Rhythm (Rhythm); is the repetition of regular and continuous motion. The real principle of rhythm is the relation of repetition of the forms of the elements.

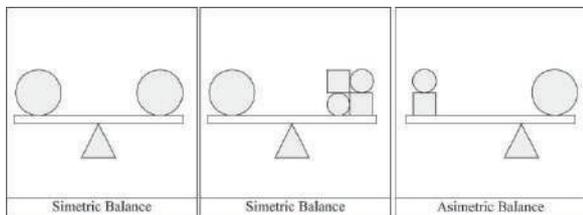


Figure 1. Symetric Balance

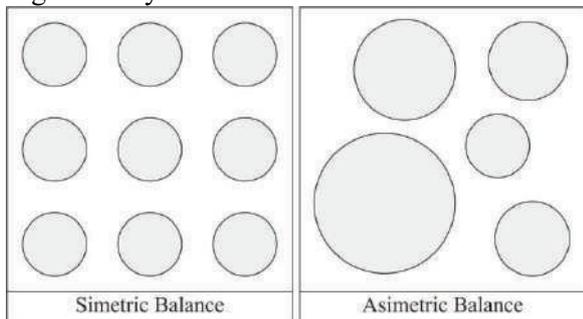


Figure 2. The balance is symmetrical and asymmetrical

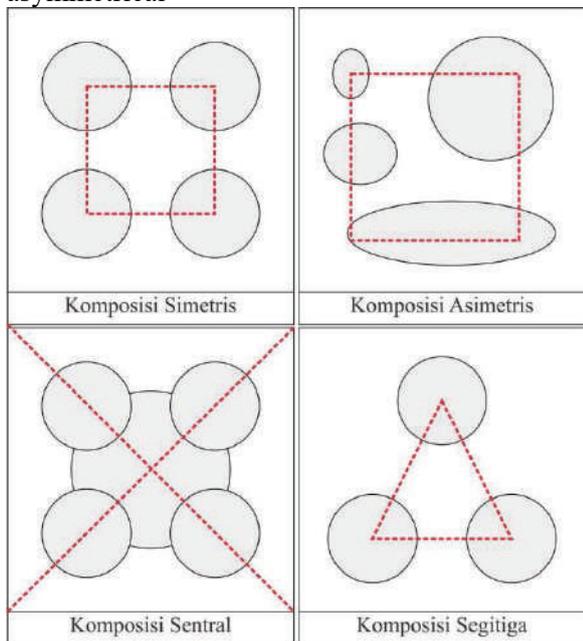


Figure 3. Balance in composition

Simply put in one of the nirmana's tasks to process the taste, the composition can be seen by considering the unity and balance aspects. The shape proportion is limited to the boundary

of the task, while the rhythms converge into one pattern in the direction of motion or unity. As an example of the following task

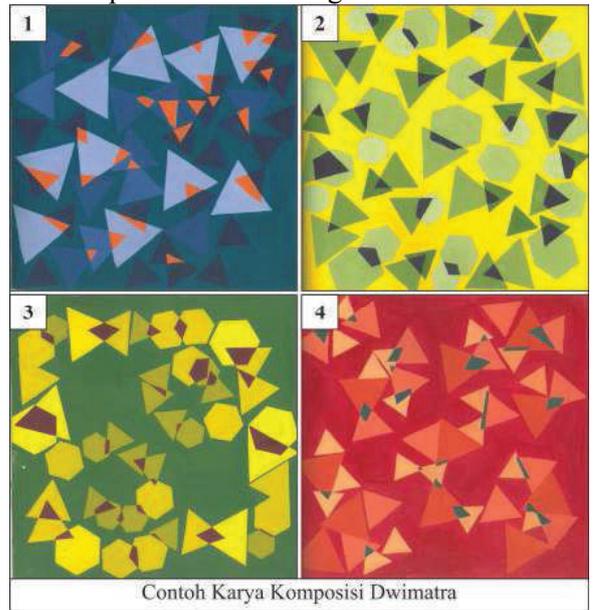


Figure 4. Examples of compositions of dwimatra in the preparation of geometric objects in the field of images

To categorize the tendency of the composition in processing the form, then the resulting pattern can be seen based on; Similarity, Continuity, Closure and Proximity (Bestley, Rusell, 2011; p.28-29). And the simplest method in understanding the composition is by tracing the pattern of unity and continuity. [5]

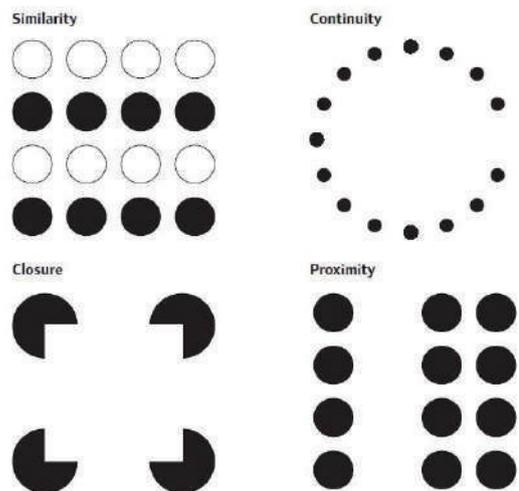


Figure 5. Similarity, Continuity, Closure, Proximity

RESULT AND DISCUSSION

Balance based on the distribution of geometric objects can be easily seen with respect to the unity of fields and the existence of empty fields. The balance is visible between symmetric and asymmetrical.

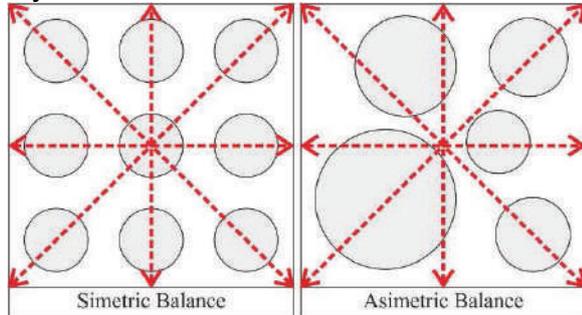


Figure 6. Tracing the balance in the composition

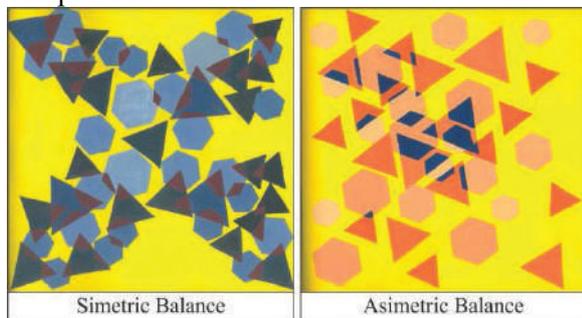


Figure 7. Example 1 is the difference in the composition of symmetric and asymmetric distributions

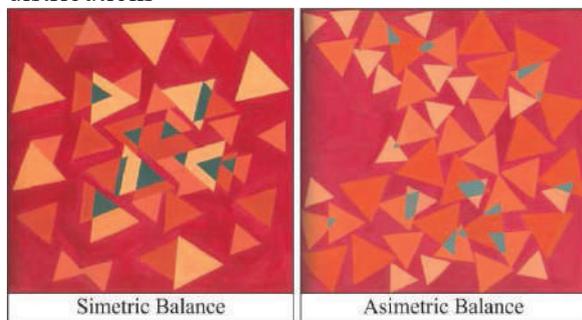


Figure 8. Example 2 is the difference in the composition of symmetric and asymmetric distributions

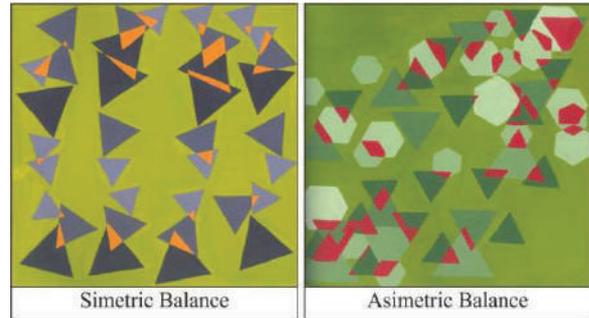


Figure 9. Example 3 differences in the composition of symmetric and asymmetric distributions

In addition to the balance on the basis of a group of unified objects, another pattern that appears to be related to the element of balance and unity is the rhythm that is formed based on the arrangement of objects. The arrangement of the object form a composition that has a special pattern and has a direction of motion. Based on the method of evaluation and tracing form obtained some student tendency in producing the composition of the field. The tendency is not absolutely wrong or true but a special learning that must be discovered and felt by the creator. Students should be able to interpret the maxims and objectives of producing the composition so that the composition can be said to be appropriate. According to Goldberg, Merrill (2003). In his book titled *Arts and Learning. An Integrated Approach to Teaching and Learning in Multicultural Settings* mentions that: Knowledge someone is not a verbal summary of the knowledge of others, but the repertoire of thoughts, actions, relationships, patterns and feelings of the person. Therefore, it is expected that students can apply their observations in an imaginative way, create their personal relationships with problems, create specific solutions and patterns in the work. While in the task nirmana pattern pattern that formed to produce the composition that really want to be shown by the manufacturer. [6]

Composition in the nirmana can be grouped into several categories including:

1. Symetric Composition

Composition is categorized as Symetric Composition because based on the resulting tracing form as if the same weight from various angles. The distribution of the shape in the field

is evenly balanced with the existing empty plane. The resulting composition with an equal weight makes the area. The resulting impression tends to be static to the direction of motion.

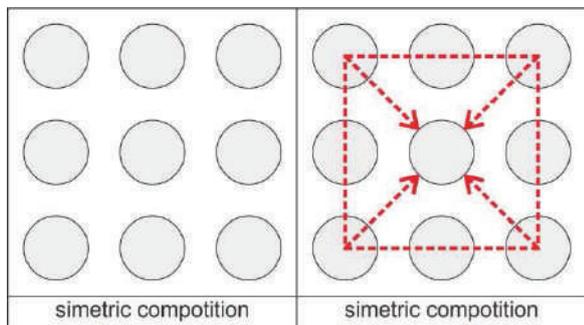


Figure 10. Tracing distribution of symmetric composition

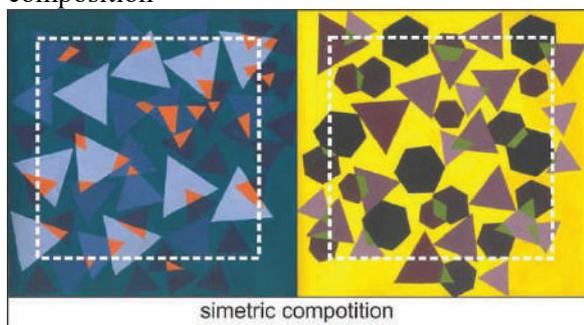


Figure 11. Example of a task with a symmetric composition

2. Linear Composition

Composition categorized as linear as by tracing form is generated as if lined up to form a line of march. Distribution of linear shape on the stage of the line. The resulting Komposisi members i the empty space with a larger area. The resulting impression tends to be dynamic and member i special motion directions but monotonous.

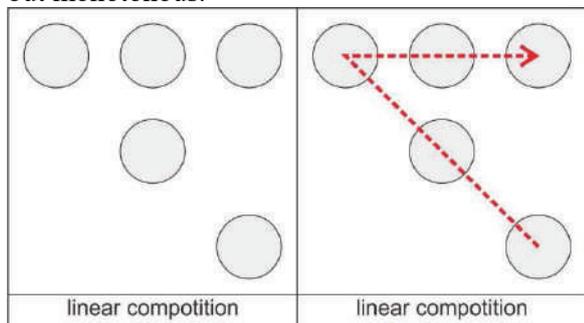


Figure 12. Figure. Tracing distribution of linear compositions Figure 12. Figure. Tracing distribusi komposisi linear

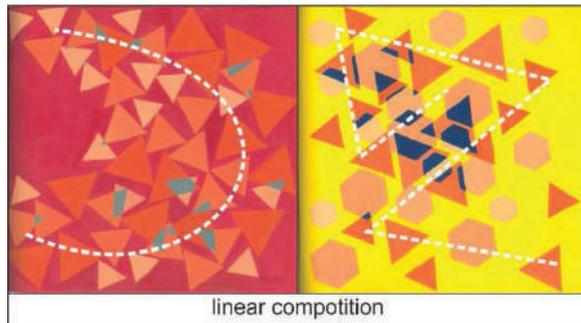


Figure 13. Example of a task with linear composition

3. Symmetric Linear Composition

Composition is categorized as Symetric Linear Composition because based on the resulting tracing form as if lined to form the line of motion but pay attention to the balance of empty space. The distribution of the shape on the linear plane forms a line and is balanced on each corner of the area. Komposisi generated seeks members i balance the empty space. The resulting impression tends to be dynamic and spread corresponding grooves. The composition can give a full impression on the area but can be complicated if not treated properly.

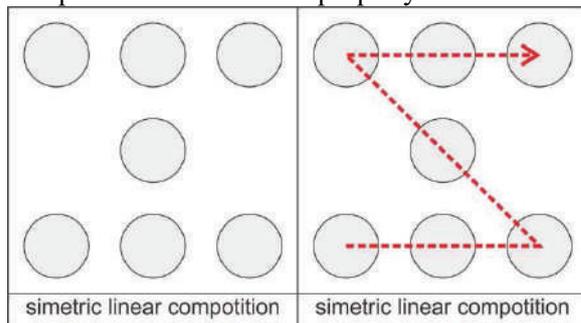


Figure 14. Figure. Tracing distribution of linear symmetric compositions

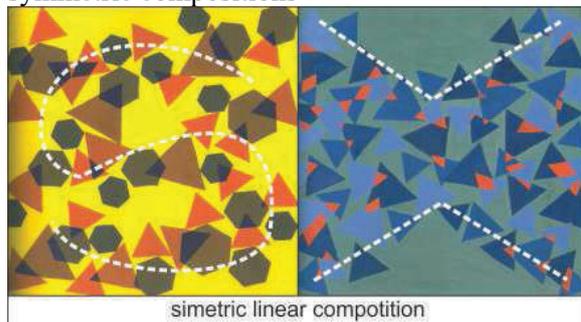


Figure 15. Example of a task with linear symmetric composition

4. Triangle Composition

The composition is categorized as Triangle Composition because based on the resulting tracing form as if grouping form a triangle field. The distribution of shapes in the linear plane separates the empty space and the composition of geometric shapes into positive and negative plane. The resulting composition leaves empty space with a larger area and makes the group of fields as if they were triangles. The resulting impression tends to be static and gives a fig h motion corresponding corner of the triangle.

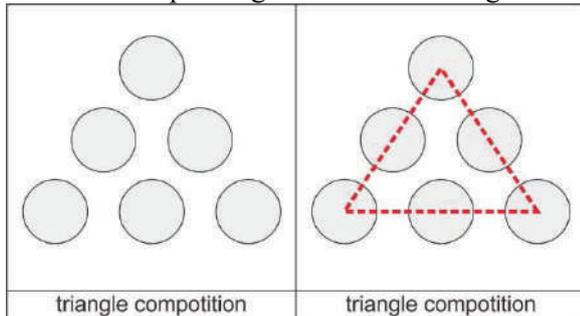


Figure 16. Figure. Tracing distribution of triangle composition

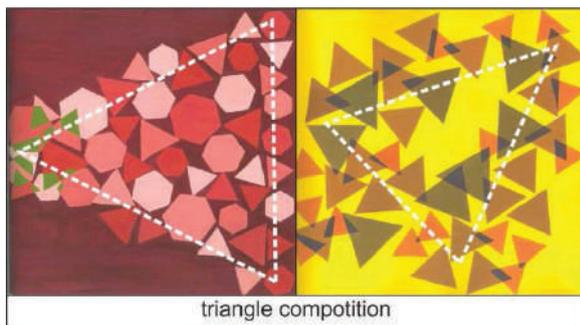


Figure 17. Example of a task with a triangle composition

5. Circle Composition

Composition categorized as Circle Composition for by tracing the form produced as if lined up to form areas of circles. Distribution of forms in the field of cluster makes the field a shadow of a circle. The resulting Kompoisi members i the empty space with a larger area. The resulting impression tends to be static.

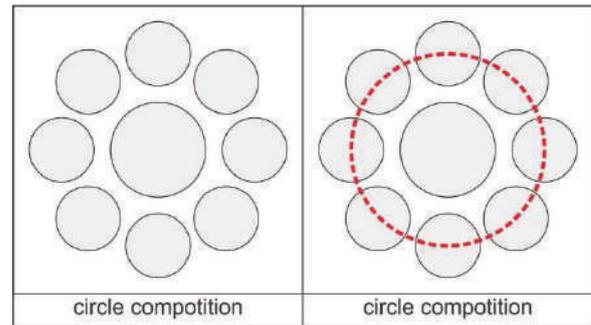


Figure 18. Tracing distribution of circle composition

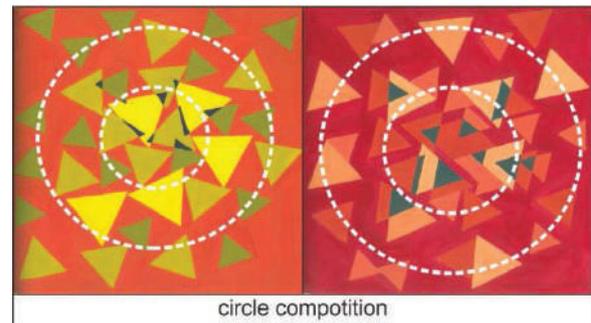


Figure 19. Example of a task with a circle composition

6. Circular Composition

Composition categorized as Circular Composition for by tracing the form produced as if lined up to form a circular motion line and pay attention to the balance of empty space. Distribution of shape on the stage centered on the middle of the field and moving in a circle towards the edge of the field. The empty space on the side of the field is wider than the middle of the middle of the field. Kompoisi generated dynamically seeks to generate a form that if a move. This composition seems the most dynamic. The composition can give a full impression on the area but can be monotonous if not treated properly.

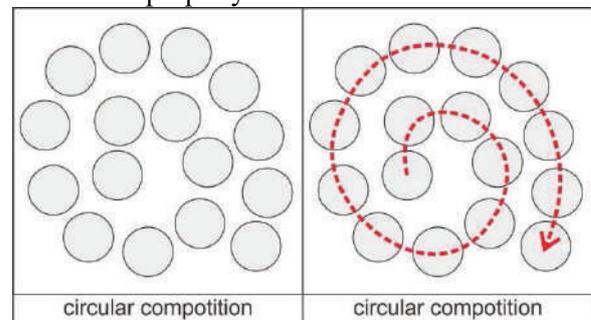


Figure 20. Tracing distribution of circular composition

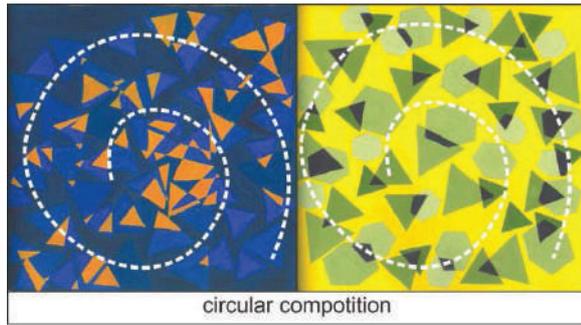


Figure 21. Example of a task with circular composition

From a variety of dwimatra works produced by students, there are compositions that seem random and unbalanced. This composition is classified as Randomize Composition. The resulting composition seems random and less attention to aspects of unity (unity). This random composition can give a complicated and unpatterned impression. The impression caused near Asymmetrical balance and empty space is clearly visible.

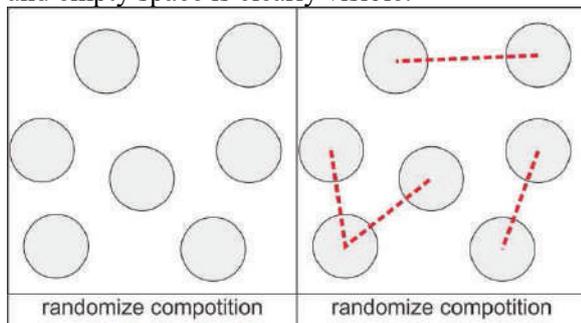


Figure 22. Tracing distribution of random composition

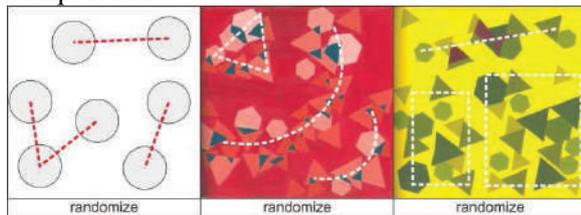


Figure 23. Tracing distribution of random composition

Besides Randomize Composition. There are some works that lack of attention to the aspect of unity in which these works give the impression of monotony or complicated.

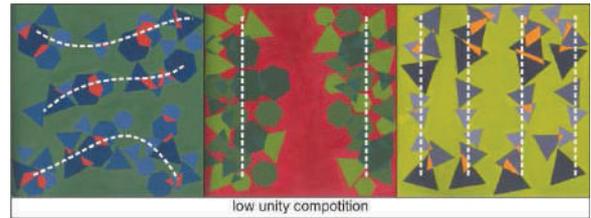


Figure 24. Example of a task with low unity composition

CONCLUSION

By studying the basic design or commonly called Nirmana, students are expected to be sensitive to the basic elements of design; field line color and size and deeper emotionally appropriate to apply the basic elements of design principles; repetition, variety, proportion, rhythm, un rough shape, harmony, ~~composition~~. Nirmana lecture begins with 2 dimensional experience or better known as Dwimatra. In the application of dwimatra practice there is a perceptual element that becomes the basic principles of design. The principle principle is influenced by the subjectivity in the appreciation of the work. One of the basic principles is composition. The composition in the dhimatra nirmana task is related to the taste of the maker. Dwimatra composition is not a matter of right and wrong but about the pattern, unity, and harmony of the object object. In the process of training the composition there is a certain tendency in accordance with the unity of the arrangement of geometric forms:

1. Composition with a symmetrical unity
2. Composition with *linear* symmetrical unity
3. Composition with *linear* movement
4. composition *triangle*
5. The composition of the circle (*circle*)
6. Kompoisasi *circular*
7. Random composition (*randomize*)

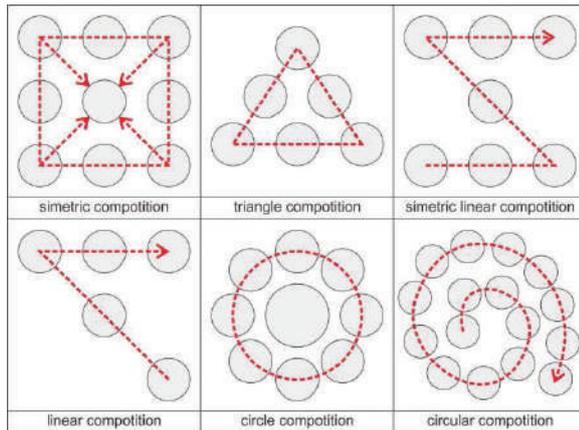


Figure 25. Distribution of compositions with several tendencies

Product design work related messages and concepts delivered in the product. One associated with the product concept is aesthetics. Aesthetics is not only a beauty but the message in the language of the visual design of the product itself. Therefore in the basic course of product design should the work produced has a certain pattern. Students are encouraged to

convey the maxims of pattern patterns established and conclude them in the characteristics and criteria of composition.

In appreciating and evaluating the basic work of product design should not look at subjectively but see the composition in a unity and harmony of form. The composition should be designed by the manufacturer. This is where art and design can be judged on the basis of its artistic quality, which is to judge everything from In terms of form, not of things outside bentuk (Rhythm Visual, 2007: 160) [7]. Therefore, after producing the work, it is necessary to have joint discussion and evaluation related to the pattern of composition of the designed patra. It is expected that in the evaluation process students are able to convey the pattern of composition that is formed, conveying the maxim of spreading patra in the composition and able to deeper emotionally find beauty based on unity and harmony of form.

- [1] Dewey, John.(2009). *Art as Experience*. New york: Springer
- [2] Sanyoto, Sadjiman Ebd. (2005).*Dasar-Dasar Seni dan Desain*. Yogyakarta : Jalasutra
- [3] Masri, Andry.(2010). *Strategi Visual Desain Produk*. Bandung : Jalasutra
- [4] Prentice, Roy.(2002).*Teaching Art and Design*.London: Continuum
- [5] Noble, Ian; Bestley, Russell.(2011). *Visual Research: An Introduction to Research Methodologies*. Switzerland : AVA Publishing
- [6] Goldberg, Meryll (2003). *Arts and Learning. An Integrated Approach to Teaching and Learning in Multicultural Settings*. Newyork: Logman
- [7] Sanyoto, Sadjiman Ebd.(2007) *Irama Visual*. Yogyakarta: Jalasutra

Redesign of ITS Website to Support The Campus in Becoming A World Class University

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Abstract — Website for educational institutions represents their existence in the virtual world. Nowadays the internet society has established many ways to evaluate and rank a university or institution not only based on their academic and non academic merits, but also by its website's quality. The redesign of ITS Website is a project undertaken to support ITS's vision of becoming a world class univeristy by entering the world's top 500 best universities. The measurement variables for ITS rankings are Webometrics, Quacquarelly Symone (QS), World University Ranking (WUR), and 4 International Colleges and Universities (4ICU) due to their website assessment. For that purpose, this project is carried out with several methods to ensure the best outcome for the website involving a deep interview with stakeholders, literature study on content strategy and user experience, information structure reorganization, and user interaction designation. The objective of this website redesign is to attract the attention of new students and future prospective students for ITS. In addition, the project result is expected to be able to improve ITS web performance in achieving a better ranking. The final outcome of the project itself is a website design with new user interface, feature, content structure, platform strategy, and media deployment.

Keywords – Content, ITS, Redesign, User-Experience, User-Interface, Website

1. INTRODUCTION

Competition among universities in Indonesia is getting tighter, especially for state universities. Each university is required to be a world class university by being ranked in the world's top best 500 to increase the competitiveness in the global era. Institute of Technology Sepuluh Nopember (ITS) is no exception to that rule.

Webometrics, Quacquarelly Symone (QS), World University Ranking (WUR), and 4 International Colleges and Universities (4ICU) are widely used to measure the university

rankings. QS and WUR for example, they consider each university's academic reputation, employer reputation, student to faculty ratio, citation per faculty, and international student/faculty ratio to determine each university ranking. While Webometrics emphasizes more these four factors in their evaluation, which are impact, openness, excellence, and presence. So it is very important for ITS to improve the quality of its website to boost some of those points.

A human-centered design is needed to make a good website. The steps can be started by doing

pre-research first, then arranging the information organization, creating the user experience, and planning the web development.

2. METHOD AND THEORY

Firstly, inventory and content auditing method is conducted to map the website content and its quality, especially the information showed in the main website. Then a method of sorting card is applied to map the menu and architecture of the website. Repetitive and unnecessary information will be rid of or minimized while contents of similar theme will be sorted and properly categorized.

Table 1. Example of Form Used in Inventory and Content Auditing Method

General Information	Content Format	Credit	Content Quality		
			Poor	Average	Good
Department Profile					
Department History					
Degree Program					
Field Program					
Laboratorium					
Job Prospective					
Industry Collaboration					
Alumni Page					
University News					
Research Product					
Research Innovation					
Society Impact					
Admission Page					
Student Testimony					

For the best outcome, a comparator study is run with Royal Melbourne Institute of Technology (RMIT) and University of Michigan (UMich)’s websites because of their better website’s quality. Followed by deep interviews which are conducted for campus internal such as the rector, academic senate, ITS students; and for publics such as industry representatives, prospective students, and university partners.

Then an affinity diagram is used to sort the problems found, research results, and solutions to help creating the design concept. From there on, the design prototype for the main parts of website including the homepage, navigation bar, and sub navigation bar that suit the user needs best are made.

3. RESULT AND DISCUSSION

The website output that allows the user to easily search for information within the website contents is realized by the new navigation

menu. The navigation menu is divided into two parts.

The first part is the main menu navigation that contains menus based on the content topics. We have classified the topic into six categories which is Study at ITS, Campus Life, Research, Industry, Initiative, and About ITS.

The second part is a sub menu navigation bar arranged according to specific user groups who have their own interests in accessing the website. The user groups listed are for prospective students, current students, lecturer and staffs, parents, and alumni.

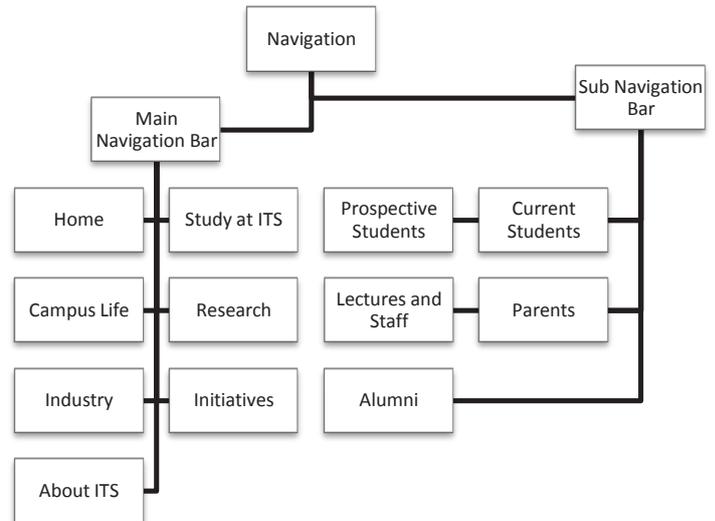


Figure 1. A Diagram of Menu Division in Navigation Bar

The search feature is added for easier searching. In addition, selection of studies is not directly differentiated by faculties or departments but rather by the nature of the field study in ITS such as natural sciences, engineering, marine science, art and design, etc. Most of the pages in the website are also equipped by help service corner to assist users.

Certain changes are applied in how to deliver the website contents. From the use of formal language with more friendly and communicative words to the selection of color tones and photos displayed in the pages that will brighten the website atmosphere while still achieving the mean to give each user a lot of insight about ITS.



Figure 2. Beta View of ITS Website Home page in Bahasa Indonesia

4. CONCLUSION

This way, routine visitors of ITS website have the options to access information they need

more neatly either based on the user group or the content topic. For example, high school students can directly go to ‘prospective student’ menu to get the latest information about ITS and how to submit application.

Beside the menu division in navigation bar, a sitemap is provided in each page to facilitate access in certain topics. In the previous website there is no sitemap so visitors who are not familiar with the website have to figure it out by themselves to find the needed information.

The output of this project hopefully is more than able to fulfill the website standard in elevating the campus’s reputation not only in Indonesia but also abroad.

REFERENCES

Book

Nodder, Crish. (2013). *Evil by Design*. United States of America: Wiley Publishing.

Marton, Bella. Et al. (2011). *Universal Method of Design*. United States of America: Rockport Publishing.

Wiryawan, Mendiola B. (2011). *User Experience (UX) Sebagai Bagian Dari Pemikiran Desain Dalam Pendidikan Tinggi Desain Komunikasi Visual*. Jakarta: Universitas Bina Nusantara.

Garrett, Jesse James. (2010). *The Elements of User Experience: User-Centered Design for The Web The Content Strategy*. United States of America: Pearson Education Publishing.

Halvorston, Kristina. (2010). *The Content Strategy for Web*. United States of America: New Riders Publishing.

The Development of The ITS Mascot Design to Amplify Visual Branding

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Abstract — Mascot, beside its function as feature or identity, it could also be developed into a tool for building the entity of the brand itself. As a part of visual identity, a mascot could even become a part of legal property of the brand entity. Although fundamentally, *Institut Teknologi Sepuluh Nopember (ITS)* already has official attributes for its visual identity i.e. logo, symbol and color identity, but there is a high chance for developing a mascot character as a support for promotional activities and branding amplification of the institute. This research aims to develop the character design of ITS mascot as a part of ITS identity in order to amplify institutional branding. Through authentic ITS mascot design, it's expected to be a unique identity of the institute, which could also be developed as visual attribute in campus events, institute promotions, souvenirs, as well other merchandise. The result of this research could be utilized as materials review policy in implementing mascot design as a part of visual identity property of the institute.

Keywords – *Mascot, Visual Identity, ITS Branding, Character Design.*

1. INTRODUCTION

The recent application of mascot is common in educational institution, sports event, organization, club, etc. Its presence helps to amplify the visual identity and entity of the brand. Various campuses around the world also have mascot as a part of their visual asset, marketing tools and branding which makes theirs stand out from other campuses brands. Campus activities such as sports event, exhibition, *dies natalis* and any other student activities would be merrier with the presence of the mascot. Character design of the mascot is usually a certain personification adjusted with the activity or the institute philosophy itself. The form of the mascot could be in 2 dimensional form or 3 dimensional form.

Along with the power of ITS transition becoming *Perguruan Tinggi Berbadan Hukum*

(PTN BH), it's time for *Institut Teknologi Sepuluh Nopember (ITS)* to start its self-organizing for amplifying its brand. For example, through the development of unique, strong and authentic visual identity. One of potential visual identities to be developed by ITS is a mascot. The ITS mascot, in addition of functioning as identification tool, it could also be optimized as a tool for amplifying institutional visual branding. The other advantage of the mascot is the flexibility and informal application. Furthermore, this ITS mascot also has highly possibility to be a part of the institute's legal property which can be patented.

An authentic and unique ITS mascot design could support institutional activities such as: campus events, *dies natalis*, souvenir production and promotional event in online media and

offline media. But the matter of creating a mascot design which could represent ITS entity is not an easy task. Therefore, this research become an important thing to do in order to search and find the concept of the mascot so it can be more precise in representing ITS as ITS icon. This research aims to develop the concept of mascot design of ITS more comprehensively as a part of amplify visual branding.

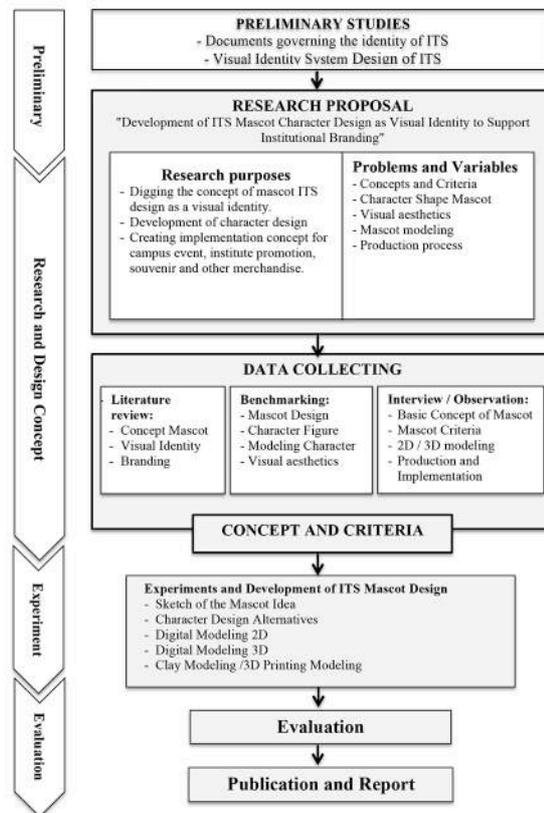
The result of this research can be can be utilized as materials review policy in implementing visual identity system in ITS environment. Furthermore, this mascot design also can be developed for campus event identities necessities, promotion, souvenir and institutional merchandise. For academic, the result of this research can be utilized as study material and reference for students who study about visual identity system and branding.

2. METHODOLOGY

This research is done through several stages. It is started with preliminary studies on the formal document as guidance that regulates matter regarding ITS identity, i.e. Peraturan Menteri Pendidikan dan Kebudayaan Republik Indonesia Nomor 49 Tahun 2011, Dokumen Statuta ITS as formal guidance and Peraturan Pemerintah tentang Statuta Perguruan Tinggi Negeri Badan Hukum Institut Teknologi Sepuluh Nopember. Preliminary studies has also been undertaken on previous research result about “Development of Design of Visual Identity System of ITS” thus it could be more integrated with each other.

The next stage is data mining through study references, benchmarking, observation and interview with some academic communities in ITS for finding the very first concept. The further stage is doing experiment of the design pan of mascot design in 2 dimensional design and 3 dimensional design.

The Stage of Research



Picture 1. Chart of ITS Mascot Research Process

3. RESULT AND DISCUSSION

Mascot

From *Kamus Besar Bahasa Indonesia* (2001: 563), mascot is person or animal which is enacted as sign of lucky or safety by a community¹. As a logo, an interesting mascot design can help increase branding of an entity. Some mascot designs are more famous than entity of the brand itself.

The existence of mascot is a marketing strategy and branding that makes a company entity or brand looks unique among the others. Many companies succeed in creating mascot design which is unique enough to stick to our memory, such as McDonalds and Disney—who use mascot to build their brand and proved successful in its development. In this case,

¹ Kamus Besar Bahasa Indonesia (2001: 563)

mascot does not only function to build the brand but also give special touch and stick to the memory of people.



Picture 2. Example of mascot character who represent each entity

(Source : <https://d23.com/walt-disney-archives/> and other sources)

For a company or institution, functions of mascot are; as reminder, marketing tool, gain interest, pride of institute, as well tool to support success of a product. Many people are questioning why certain brand use mascot. The answer is because mascot will be so effective for promoting a product, not its service. Not only needing creative design for gain customer interest, but also all of good packaging of the brand itself make brand interesting for customer.² (Gondokusumo, 2012).

Not only give personality to the brand its represent, but mascot also gives creative and emotional touch for those who see it. Mascot design can be used to give entertain value for all brands and become first image that seen people as brand. Mascot also has role in selling brand by promoting its business. Every mascot usually has a nickname so people more familiar with it. Recently, mascot often used by big events such as sports, Olympic, university club, etc.

Visual Identity and Branding

² Gondokusumo, 2012: Desain mascot untuk kesuksesan sebuah-brand.

Visual identity is a visual graphic combination that made into solid unity to deliver certain characteristic. In an entity, logo or mascot is the face and important identity because the function of both is as characteristic that physically can differentiate one entity with other.

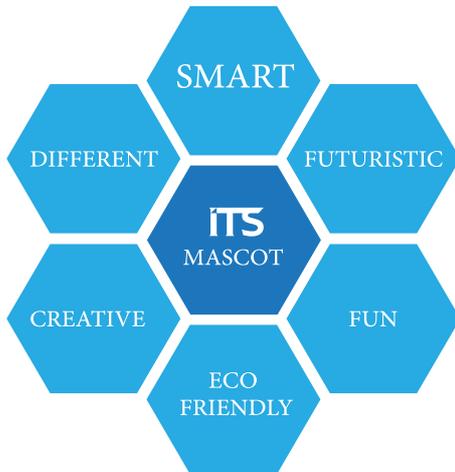
Meanwhile, brand has more meaning from just a logo or a mascot. Therefore, in this case, visual identity not only used as identification tools, but also as a tool to understand philosophical meaning of the entity itself. If logo and mascot is a physical object that can be seen, so brand covers the whole, both physically and non physically. If compared as a human, logo is the face of the human and identity is the appearance, behavior, and the way he communicates, so brand is all his body and soul. Meanwhile branding is a set of communication activity done by company in development process and makes brand bigger. (Amalia : 2010).³

The Development of ITS Mascot Concept

Based on the result of preliminary research through a questionnaire to the ITS academic community that the desired from a mascot is to give personality, positive image for ITS brand, and also give creative and emotional touch. ITS mascot design also expected to give entertain value and give initial image that will be seen by people as ITS brand. This ITS mascot expected to promote ITS activity and has unique nickname and has character so people can easily recognize so the mascot can be used for campus events such as sports events, olympic, campus activity units, and other campus activities.

³ Amalia E. Maulana, 2010: Brand, branding dan Perannya bagi Perusahaan.

CONCEPT OF MASCOT ITS



Picture 3. ITS Mascot Basic Concept
(Source Dokumen Statuta ITS, 2017)

In addition to the character form of identity, one of important elements in visual identity design is color. Color has function not only as a visual appeal but also as an effective identification tool. It is common that corporate color used in media applications is also the same color as the color in ITS emblem, but there's another case that they use the development of the color. Therefore, we can identify an entity of company or organization in regards to their color. This is the identity color of ITS which is from gears from in ITS emblem. This three colors will be developed in mascot design later.

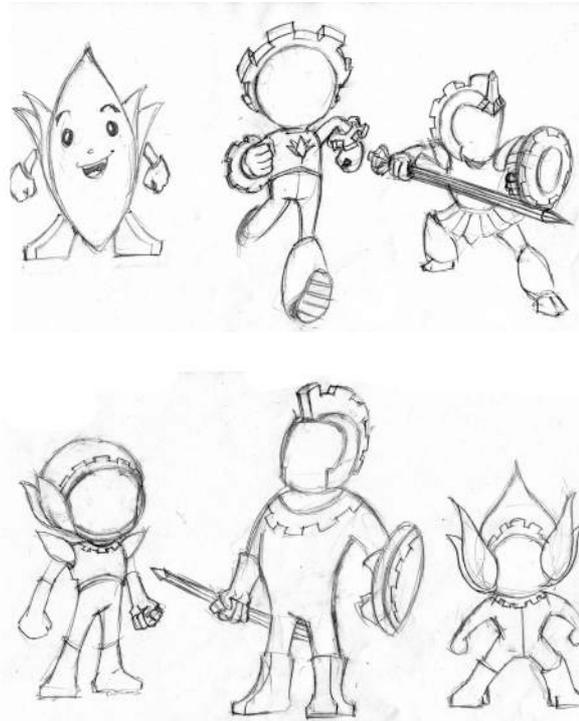


Picture 4. ITS Emblem
(Source: Dokumen Statuta ITS, 2011)

Brainstorming Idea

These are sketches from experiment result and development of mascot design of ITS. Almost more than 20 character studies have been done

in mascot visualization. Each character grouped by the theme.



Picture 5. Mascot Alternative Sketches

Character Design Alternatives

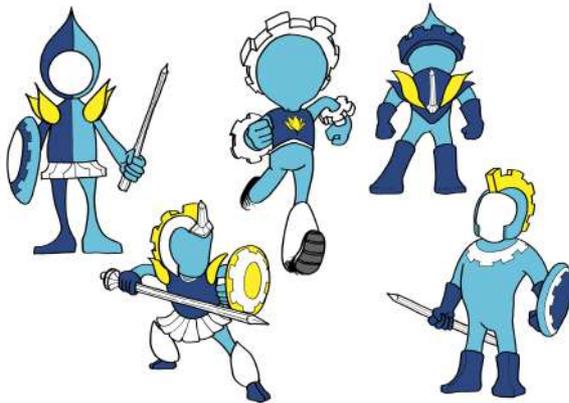
One of the aspects that became the reference of ITS mascot design concept is visual identity. The element of visual identity in this case is not only related with formal element in ITS itself. But also related with 'brand' aspect and 'image' ITS in the society. Those element is how people see ITS as one of biggest institution in Eastern of Indonesia. Branding elements that will be carried later will be categorizes in some themes, that in the end will become a reference in visual identity elements in ITS mascot design. Meanwhile from the character form will be more use human character or robot humanoid.

As the outline, there are four themes that will become reference in design activities; warrior, high-tech, mechanic and fun.

a. Warrior Concept

This theme based on ITS image as a warrior campus. Those nickname is not given only because ITS is located in the city of heroes, but also it describes spirits and fighting power of the ITS faculties, staff, and students (later will be strong and tough fighter.

The form and color elements that become character attribute are adapted from ITS logo which are already elaborated become separate ornaments. The heroes monument with white color (symbol of heroes spirit) in some alternatives is used as 'tombak' (spear-shaped weapon) or javelin. Wijaya Kusuma flower with yellow color (symbol of a virtuous Pancasila cadre) used as shoulder armor in some characters. This design is symbolism of character as a responsibility that should be borne. The jagged engine wheels (symbol of engineering) in some characters used as head armor as symbol of intelligence and mindset of ITS academia as engineers.



Picture 6. Mascot alternatives with Warrior theme

The colors that used in the character also adapted from ITS logo; yellow, white, deep blue, and light blue. The meaning of virtue and brilliant future is considered quite relevant for applied in characters with warrior concept. The color placement in character has no special meaning because it's only for esthetic and harmonization purposes.

b. Mechanic Concept

This theme is based on ITS status as technology institution where it intersects to all things related to engineering and mechanics. Therefore, the outline of the character is symbolized a professional and tough mechanics.

The form and color elements that become character attribute are adapted from ITS logo

which are already elaborated as separate ornaments. The dominant part in this theme is wear-pack or coverall (safety clothes) and helmet. The differentiation of each character showed by helmet and shoes design.



Picture 7. Mascot alternative with Mechanic theme

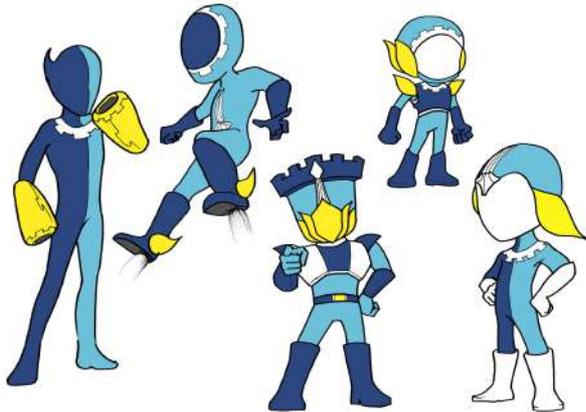
In most of the characters, ITS logo element is adapted as decoration in the head of the character. The reference for head design is some modern helmet design and modified with ornament in ITS logo. This concept makes ITS identity aspect emphasized in the face of character. Meanwhile, the form and proportion of the body is more following the stereotype of athletic man in general.

The colors that used in the character also adapted from ITS logo; yellow, white, deep blue, and light blue. The meaning of virtue and brilliant future is considered quite relevant for applied in characters with mechanic concept. The color placement in character has no special meaning because it's only for esthetic and harmonization purposes.

c. High-tech Concept

This theme is based on ITS image that performs high productivity in producing innovation with high technology. The figure depicted is like ITS mission to contribute to advancing technology and serving the community. The character design in this concept is using futuristic elements and robotics with some fictive accessories such as plasma canon, jet shoes, advanced helmet. Overall, the high tech concept showing design that leads on superhero image. Of course with characterization of heroes

stereotype such as defender of truth, strong, bold, obey the law, without ulterior motives, social care, etc.



Picture 8. High-tech mascot concept

The form and color elements that become character attribute are adapted from ITS logo which are already elaborated as separate ornaments. In some designs, ITS logo elements adapted as base for of accessories of the character such as shoulder armor, helmet, mouth guard, visor and collar costume.

The colors that used in the character also adapted from ITS logo; yellow, white, deep blue, and light blue. The meaning of virtue and brilliant future is considered quite relevant for applied in characters with high-tech concept. The color placement in character has no special meaning because it's only for esthetic and harmonization purposes.

d. Fun Concept

This theme is created for makes ITS image as college with fun learning atmosphere, friendly and service-oriented. The character design in this concept describe as cheerful and humorous figure. Some designs have abstract body form but still have characterization of humanoid. Most of the characters adapted the form of classic joker and clown because can represents the concept stereotypically.

The form and color elements that become character attribute are adapted from ITS logo which are already elaborated as separate ornaments. In some characters, Wijaya Kusuma flower which has yellow color used as

headgear, accent on the ear, gloves, wings and shoes. Jagged engine wheels modified in order to change the rigid shape into more flexible shape.

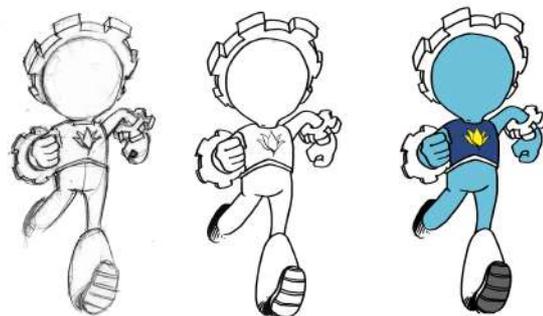


Picture 9. Mascot alternatives with Fun theme

The colors that used in the character also adapted from ITS logo; yellow, white, deep blue, and light blue. The meaning of virtue and brilliant future is considered quite relevant for applied in characters with fun concept. The color placement in character has no special meaning because it's only for esthetic and harmonization purposes.

Digital Modeling 3D Mascot Character

This is the result of the development of mascot design of ITS (alternative 1) that is the embodiment of visual character of the strong and tough warrior.





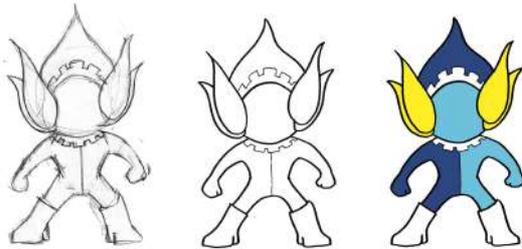
Picture 11. Comprehensive Mascot Design
(alternative 1)



Picture 13. Comprehensive Desain Maskot
(alternative 2)

Development of Alternative 2

The development of ITS mascot (alternative 2) is the merger of visual character of cheerful warrior and has a little humorous gesture but still has humanoid characterization.



Picture 12. Sketching Stage and Digital Coloring
(Source : doc. researcher)

ACKNOWLEDGMENT

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REFERENCING

1. Aaker, David A. Building Strong Brands, The Free Press, New York.1996.
2. Arnston, Amy E, *Graphic Design Basics*, Holt, Rinehart and Winston Inc, 1988
3. Balmer, John, M.T & Edmund R. Gray.” *Corporate Identity and Corporate Communications: Creating a strategic advantage,*” Corporate Communication. 1998
4. Berryman, Gregg, *Note on Graphic Design and Visual Communication*
5. Clarence P. Hornung, *Handbook of Design & Devices*. New York : Dover Publication Inc,. 1959.
6. Henry Dreyfuss, *Symbol Sourcebook*. New York : Mc. Graw Hill Company. 1972.

7. Herman Zapft, *Manuale Typhographicum*. London : The MIT Press. 1970.
8. Lillian Garret, *Disain Visual*. Penerjemah Budihardjo Wiryodirdjo dan Bambang Dwiantoro. Yogyakarta : Fakultas Seni rupa dan Disain ISI. 1986.
9. Morioka Adams. 2004. *Logo Design Workbook- A hands on Guide to Creating Logos*. USA: Rockport Publishers, inc.
10. Murphy, John and Michael Rowe. *How to Design Trademarks and Logos*. Ohio : North Light Book, 1998.
11. Pilditch, James, *Communication by Design*, McGraw-Hill, 1970
12. Rustan, Suriyanto, S.Sn.2009. *Mendesain Logo*. Jakarta: PT Gramedia Pustaka Utama.
13. Sayatman, 2014. *Pengembangan Desain Sistem Identitas Visual ITS yang Terintegrasi Dalam Rangka Penguatan Brand Institusi*. ITS
14. Swann, Alan, 1987. *Basic Design and Lay Out*, Phaidon – Oxford
15. Wiryawan, Mendiola B. 2008. *Kamus Brand A-Z*. Jakarta: Red & White Publishing.

The Studies of Student Attachment in Environment Behaviour at Studio Classroom

Case study: Studio Classroom of Interior Design Department ITS

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Abstract — Human behavior in a room is determined by the comfort factor of space. One of them is the furniture layout in the room. To improve productivity, the layout of furniture with a good circulation needs to be adjusted based on user needs and comfort. The arrangement of furniture in this case becomes important, therefore the study of environmental behavior design on student attachment is necessary considering the room is used for learning. Objects taken are similar-sized studio classroom 101 and 305 Interior Design Institut Teknologi Sepuluh Nopember (ITS) which used everyday.

Keywords – *behaviour, furniture layout, attachment, circulation, studio class*

1. INTRODUCTION

According to Lang (1987), there is a reciprocal relationship between human behavior and the built environment. The study relationship of human behavior and the built environment is known as the Environmental Behavior Studies. So far, research on Environment Behavior Studies emphasizes social and psychological aspects. Not many studies of these types that relate specifically to the treasury of design knowledge, especially interior design. The study of Environment Behavior Studies in the treasury of interior design knowledge is not much different from the study of architectural sciences, which is not only

about the function of space but more on the quality of space, so that humans can utilize space according to the desired behavior (Snyder, 1979). There are many studies of Environment Behavior Studies that discuss the behavior of occupants in a residential environment. Not many behavioral studies have been found in the educational environment, in this case the design campus. The interesting thing to be studied in the design campus is the students as the activity actors have the character of activity and the different lecture needs with other students. According to the curriculum, the design learning process, in addition to being given face-to-face theory, they also have independent activities, namely consultation

and studio work process. Design studio is the core space in the interior design course. According to the character of studio lectures, the students are required to work in space independently but structured. The sense of having a studio room by observing student attachments while working in a studio is one of the parameters of analyzing the reciprocal relationship between the perpetrator and the built environment.

2. LITERATURE AND THEORY

There are several necessary theories to support this research, including place attachments, studio learning area ergonomics, furniture layout, and circulation.attachment.

- A. Attachment to a place is the need to search and gain closeness for reasons of comfort, safety, security and protection. According to Bowlby (1982 in Prakoso S, 2015), basically everyone has an emotional experience with a particular place, both pleasant and unpleasant. The place is meant is where we live and daily activities.

Hakkinen A and friends (2012) also describes attachments to places based on the following aspects of review:

(a) Performers. There are 3 levels of actors: the individual level is done by individuals so that they are personal, group level is done by groups that symbolically share the place of activity, as well as the overlap level performed by individuals as well as groups.

(b) The process of psychology. It is the psychological process of an individual / group relationship to a place. (a) affection, is attachment to the place emotionally meaningful positive (b) cognition, is attachment to the place due to memories-beliefs-meaning & knowledge, (c) Behavioral practices, is actions related to the place.

(c) Object / place. Distinguished socially and physically. In socially, place attachment is caused by social relationships and group identity. While physically, differentiated on the spatial scale of space, city, built environment and

natural environment.

Scannell and Gifford (2010) have also described an organizational framework known as tripartite model of place attachment. An organizational framework consisting of 3 separate dimensions, but complement each other in understanding place attachment, is the dimensions of people, processes and places. The preferred first dimension to be discussed is the person, who the perpetrator has attachment to a particular place. This can happen on an individual or group / group level. The second dimension is the psychological process, how the role and the combination of emotion, cognition and behavior in a particular place. The last dimension is a place object character. Scannell and Gifford mean places in physical and social studies. Physical as a form of built environment, while social as a function of symbol or arena / social means.

The research above supplements the understanding of attachment to the place in Scannell and Gifford (2010) research, but Hakkinen adds to the perpetrators at the overlap level. This means that attachment to the place can occur because of the needs of individuals and groups. But how the psychological process between individual and group interests has not been discussed further.

Physically, according to Gustafson (2014 in Prakoso S, 2015) attachment to a place is a route that represents an emotional bond to a place based on personal preference, especially since the person has high mobility. For example, attachment to the place because of the needs of work convenience, ease in interacting with friends, security in storing personal needs, safety or protection against harm. Therefore, emotional bonding in place can occur in some places. As for the social, caused by the existence of bonds to institutions or joint ownership, social activities, satisfaction to the environment and the presence of friends or colleagues in a particular environment.

The physical attachment is closely related to the character of the behavioral

environment according to the needs of the user. Users have high ownership of an object or place, if the character of the design environment support activity. Ownership may occur temporally or permanently. As explained by Altman and Chemmers (1984) the following:

There is control and ownership of place or object on temporary/permanent basis. The place or object may be small or large. Ownership may be by a person or group. Territoriality can serve any of several functions, including social fuctions (status, identity, family stability) and physical functions. Territories are often personalized or marked. Defense may occur when territorial boundaries are violated. (hal. 121-122)

Based on the statement, the attachment to the design environment has characteristics (1) can be temporal or permanent, (2) place or object can be small or large scale, (3) ownership by individuals or groups, (4) Facilitate several functions, (Status, public interaction) and physical functions (tool storage, work convenience)

B. Ergonomics according to Nurmianto Eko in his book entitled Basic Concepts and Applications (2004), ergonomics can be defined as the study of human aspects in the work environment reviewed by anatomy, physiology, engineering, management and design.

Based on the study, the ergonomics required in this study are:

a.) Working table

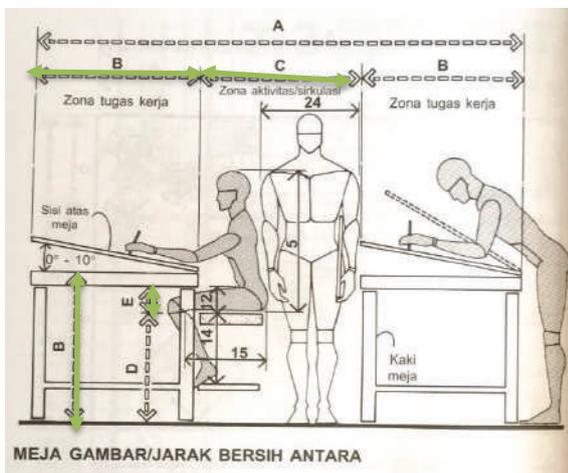


Figure 2.1 Clean distance between tables

	in	cm
A	108-120	274.3-304.8
B	36	91.4
C	36-48	91.4-121.9
D	21-27.5	53.3-69.9
E	7.5	19.1
F	48-60	121.9-152.4
G	36-60	91.4-152.4
H	30	76.2
I	12	30.5
J	54-60	137.2-152.4
K	27-30	68.6-76.2

Figure 2.2 In between tables guide dimension

The figure above shows the range of net clearance between tables (C) and the various clearances required for a proper intersection between the person sitting and standing with the table. Tables as high as 36 inches or 91.4 cm, as opposed to ordinary table height, will allow the use of a desk either sitting position or in a standing position.

The exact minimum clearance between the top of the seating surface and the underside of the table as shown (E), is very important because it will allow the user to work on the table. An altitude-adjustable bench can greatly help offset any variation in body size. The presence of footrest is also an important consideration.

b.) Visibility to the screen

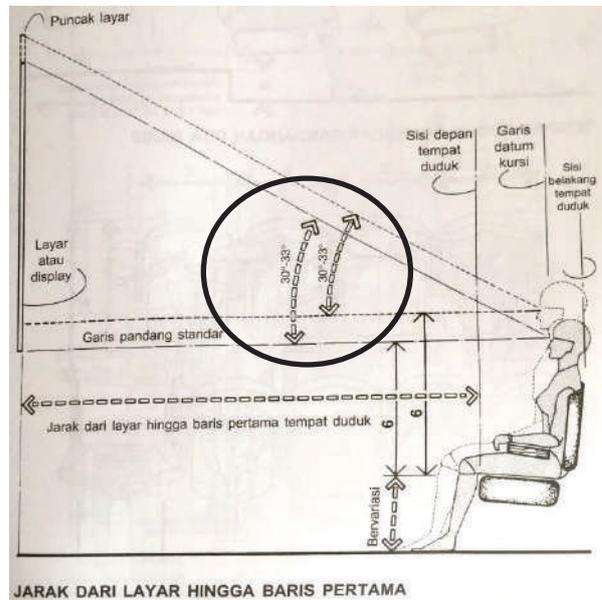


Figure 2.3 Visibility to the screen from first row

	in	cm
A	59,0	149,9
B	56,3	143,0
C	57,8	146,8
D	68,6	174,2
E	72,8	184,9
F	28,1	71,4
G	29,6	75,2
H	27,3	69,3
I	9,3	23,6
J	33,9	86,1
K	36,6	93,0

Figure 2.4 Distance to the screen guide dimension

The minimum distance between the first line and the display, in this case either a whiteboard or a projector screen as a student learning medium can be defined by drawing a line of sight from the top of the projected image to the observer's eye sitting on the front row at an angle of magnitude no less from 30 degrees and not more than 33 degrees.

C. Furniture layout in classroom

Effective learning can start from a classroom climate that can create an exciting learning environment, so it is necessary to consider the arrangement of classrooms and their contents, during the learning process. The classroom environment needs to be well laid out to allow for an active interaction between students and teachers, and between students.

Actually, there are many kinds of seating positions that can be used in the class like lined back, semicircle, opposite, and sebagainya. Usually the position of the seat lined backward digunakandalam class with the method of learning lectures. And for discussion method can use the position of semicircle or dealing. And as an alternative seating arrangement with the method of group work or even the form of cooperative learning, then according to Lie (2007: 52) there are several models of bench arrangement commonly used in cooperative learning, such as:

- a. Horseshoe tables, student groups at the end of the table

The horseshoe seating type describes the authority of the teacher and separates the

teachers from all groups, while still providing supervision to each member of the group. This type facilitates consultation and communication between teachers and students, but this formation will take a lot of time when each group member has to present tasks to other group members or require discussion among members, as they must change the seating formation.

- b. Lines long tables

This type of arrangement sometimes reduces students' learning ability, because it makes the teacher have absolute authority and makes the student dependent on the teacher and does not occur group communication.

- b. Group table, students in one group are placed adjacent

In this type of seating, students more easily communicate without limitation, resulting in interaction and help-help between members, two important elements in this type, namely: leadership and cooperation. What the teacher is concerned about is that the members of each group are no more than six students, with a leader and a teacher position as a group counselor.

- c. Table square / circular shape

Circular and square tables can be used for discussion format, in this type there is no group leader, and this type is suitable for learning that requires memory or direct practice, such as on dance or sports lessons, so that students can freely see the teacher and can directly Practice what the teacher / trainer teaches.

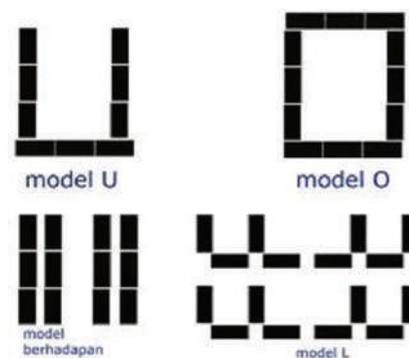


Figure 2.5 Seating position model arrangement

D. Circulation

Circulation in this discussion is space outside the furniture, usually used for student traffic in the classroom. There are several models of circulation in space based on placement and door openings among others:

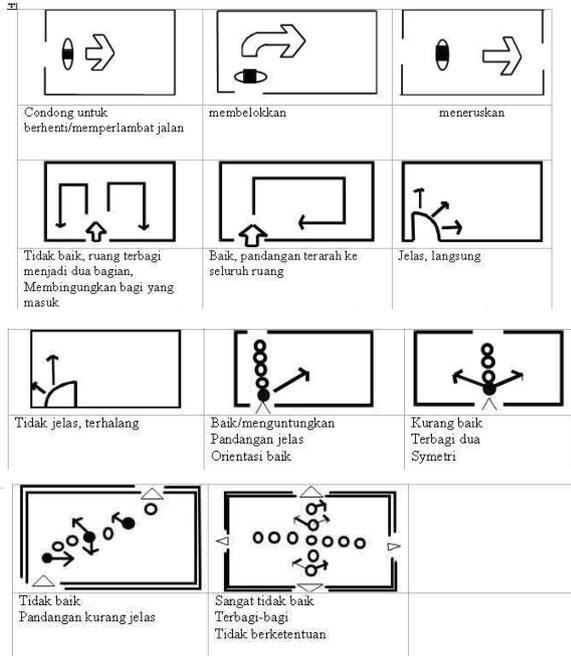


Figure 2.6 Circulation of space in general

3. DATA AND METHODS

This research is naturalistic, because it basically does not start from something 'empty' but based on the perception of researchers because of experience and knowledge obtained through the literature. The problem in naturalistic research is called focus. According to Moleong, the problem or focus is tentative meaning can be changed until the position of researchers are in the field. The change of focus / problem on naturalistic research is a sign of progress towards refinement. This research has a setting context in the built environment of lecture room in ITS Interior Design Department. The actuality that will be revealed how the character of the student design behavior is appropriate for studio lectures as well as what kind of environment behavior that supports the student design activities, so there are student attachment in the studio to work effectively. Space as a container setting behavior is not only a physical boundary

but also bounded symbolic. Lang (2010) termed this as an Advance Function. This naturalistic study not only involves physical formation as an object, but also addresses the behavior of the user as the impact that the physical object shapes.

A. Research Methods

This research uses qualitative method through phenomenology approach. Working methods using Zeisel analysis (1984), namely through observation behavior (observing behavior), observation physical traces (observing physical traces) and interviews. The three methods of work are applied in this study, because in addition to easy to do, credibility can be achieved by repeating observations and can reveal events that are likely out of predicted or rare occurrence.

B. Data Collection Technique

The design methods and data collection techniques used to produce the design are as follows:

- a.) Literature Studies: Studies of place attachments, ergonomics of studio learning areas, furniture layout, and circulation.
- b.) b) Observation with behavior mapping: done by place centered mapping is making sketches or base map. The basic sketches or maps in question are a 305 floor plan drawing and 101 Workshop room at ITS Interior Design Department. On the basic sketch / map, various alternative layouts will be created that create and maintain optimal conditions, build a positive socio-emotional climate and create a good interpersonal relationship atmosphere. The data on the sketch or base map will provide information on the available space, space, and furniture layout to be observed, embodied in AutoCAD 2D drawings.
- c.) Physical trace observations: Physical trace techniques are used to systematically look at the state of the setting so that an estimate of activity can be made. The results of observation in

the form of documentation photos, videos, notes and sketches, and can be a diagram that clarify the physical traces. Physical traces in this study aims to obtain data that complement the behavioral analysis that has been done in the observation stage of the behavior mentioned above. The needs observed in the physical trace include furniture data (form, layout, dimension, position), identity (lecture and drawing equipment, dressing mode, activity pattern), as well as other attributes related to student activities.

- d.) Questionnaire: A questionnaire on student responses on the layout of studio furniture 101 and 305 Interior Design of the Sepuluh Nopember Institute of Technology.

4. RESULT AND DISCUSSION

New students in particular as the main users in classrooms 101 and 305 Interior Design ITS majority comes from public schools. Thus, the basic capabilities of individual designs are not the same. In the basic design courses as the initial basis of design is different from the lessons learned in public schools, which requires creativity. This can be supported by a comfortable seating arrangement for students.

This research uses the object of studio classes 101 and 305 Interior Design ITS by sampling some students of Interior Design ITS as many as 63 students, with profiles of respondents as follows:

Table 4.1 Respondent Profile

CRITERIA	SUB CRITERIA	AMOUNT
Gender	Male	23
	Female	40
Generation	2013	32
	2016	31

This is done to find out the user's opinion about the comfort of seating arrangement in the studio class. In addition, researchers also made direct observations by sketching the basis of various forms of alternative layout furniture created from the existing layout.

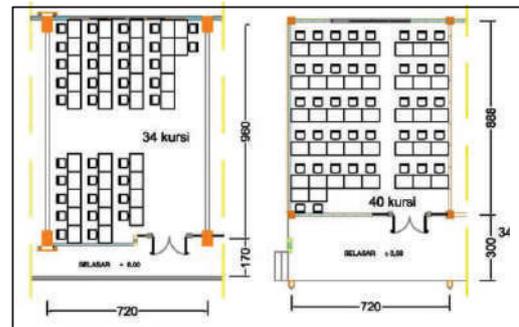
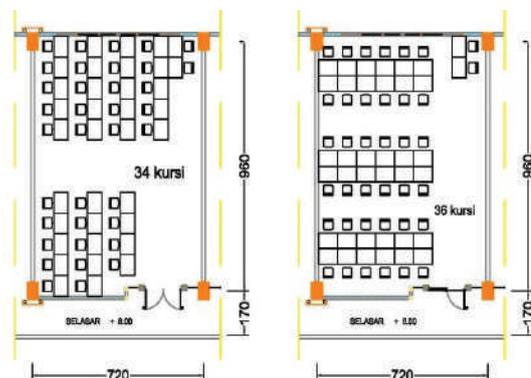


Figure 4.1 305 Classroom (Left) and 101 Classroom Existing Layout

Here is a sketch or base map of the location of the studio space that will be used as an observation. In setting lay out existing second space, use model of Seminar / Length Desk. In room 305 only able to accommodate 34 - 38 seats. The addition of 4 seats can be placed at the front door. This addition is ergonomically inappropriate, because it interferes with access to circulation. Distance between tables is 80 cm. In setting layout Room 101 Workshop, able to accommodate 40 seats, with the distance between tables 80 cm. Setting lay out above looks solid with limited circulation access. In this position, the front row is less comfortable to view any text or material on the LCD Projector. Distance of lecturer and student desk is too tight, so the assistance system is done beside.

Setting will be done only in Room 305, a group of sight, taking into account the capacity of students at least 32 people per class. In this pattern adjust the number of students, thus exceeding the ideal maximum number of each group, as many as 6 students. Sketch setting can be seen as picture below.



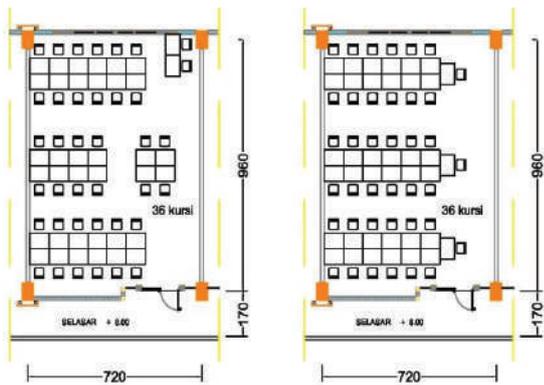


Figure 4.2 Sketches Room layout 305 and the development

In the figure above, there are three pattern development, where the first pattern of the desk of educator / lecturer is in front. In this position the grouping is seen in the student, the lecturer can observe the whole from the corner of space. In the second pattern, the middle table can be used as an island model that can be used for assistance, laying out sample objects and presentations. In this position, the lecturer can attend more than one student simultaneously. The last model is single assistant, where every lecturer coordinator and assistant lecturer can focus on student of group.



Figure 4.1 Lined Seating Arrangement

As can be seen in the picture above, with seating arrangement such as seminar lined model and the position of the blackboard and projector right in front of the students is quite comfortable to use when used for theoretical course. However, for the basic design studio course with a long duration of study time there are some students who turned his chair face to interact with his friend. Interaction is necessary as well as entertainment to support student creativity. In terms of ergonomics, this makes users uncomfortable. Similar to the results of direct observation, as many as

29% of respondents stated that the model seating arrangement was comfortable, because students convenience saw the blackboard and projector during the theory course. So the rest expressed the discomfort of a seating model like this. Furthermore, a direct observation of the parallel seating arrangement is presented in class 306.



Figure 4.2 Facing Each Other Seating Arrangement

In the figure above, the seating arrangement is faced with the blackboard position and the projector is in addition to making students rotate the chair during the theory course. This position is not too much of a problem because the time duration of the theory class is quite short. This is supported by the opinion of respondents as much as 71% stated comfortable with the seating arrangement. In addition, sitting face to face makes students more easily interact with friends, and see each other's work so as to motivate individuals to give their best work. This creates a happy atmosphere as can be seen in the picture below.



Figure 4.3 Facing Each Other Seating Situation

The wake of a happy atmosphere in the studio class with the seating system facing the students to increase creativity so that student productivity becomes better.

5. CONCLUSION

Based on the results of the study, although the seating arrangement is made in a row facing the blackboard and projector, there is still a tendency of students to turn the chair on the basic design course to interact with friends. This stated is not optimal because the duration of the time of the basic design course. Thus, the seating arrangement with the facing each other system is more precise and efficient because it only needs to rotate the chair with a short duration in the theory course. While the basic design courses with a long duration of time, students feel comfortable with can interact with friends, motivate to give the best work, increase creativity, and create a warm atmosphere in the classroom.

6. ACKNOWLEDGEMENT

Parties to be acknowledge were Interior ITS students as respondent who have helped this research.

REFERENCES

- [1] Lang, J & Moleski Walter (2010), *Functionalism Revisited*, Ashgate Publishing Limited, England
- [2] Julius Panero, Martin Zelnik. 1797. *Human Dimension and Interior Design*. Jakarta. Erlangga.
- [3] Zeisel, John (1984), *Inquiry by Design : Tools For Environment-Behavior Research*, Cambridge University Press, Cambridge
- [4] Snyder, J.C dan Catanese, A.J. (1979), *Introduction to Architecture*, McGraw-Hill, New York, Hal. 46-71
- [5] Nurmiyanto Eko (2004) *Basic Concept and the Applications*



II. CREATIVITY, CHILDREN AND HERITAGE

Character Driven and Design Development on Telaga Warna folklore for Children

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Abstract — Interest in reading Indonesian society is categorized as low and apprehensive. The reality have an impact on the low quality of human resources in Indonesia. The cause comes from many things, one of which is the lack of reading culture from an early age. As another form of effort to increase the reading interest of the community, especially children, the development of library collections and reading parks needs to be done. One form is the manufacture of children's book illustrations. The story content provided is the folklore of the archipelago, which is now beginning to lose its existence. By developing children's early literacy, reading culture in Indonesia is expected to increase. With the growing culture of reading, it will also affect the increase in the quality of human resources in Indonesia, particularly reading as a means of character education delivered through the character design on a children's book.

Keywords – *Children book, character. Indonesian folklore*

1. INTRODUCTION

The problems of the Indonesian nation today are the findings of research and observations that show the reading interest of Indonesian society is very low. Reading interest problem until now is still the actual theme that is often reviewed, discussed, and a seminar on various forums.

The results of the Central Connecticut State University in 2016 states that ranked Indonesia's interest in reading is on the order of 60 of the 61 countries in the data from the World's Most Literate Nations. ("JPNN.com Jaringan Berita Terluas di Indonesia", 2016). While the reading ability of students in Indonesia ranks 69th out of 75 countries, according to a survey conducted by the Program for International Student Assessment (PISA) tahun 2015 ("CNN Indonesia Student", 2016)

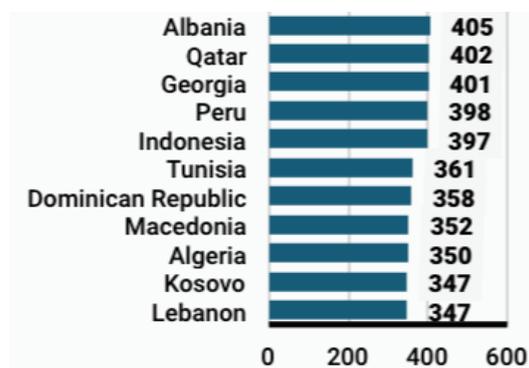


Fig 1. Reading Interest Rating by PISA

Involves the culture of reading from an early age, before the child has the ability to read, can foster a sense of love of children to reading and books. By reading or listening to a story in the book on a regular basis, children are able to recognize and remember new vocabulary or who have not previously understood. In the long run, children who are familiar with books early (pre-school age) have higher levels of reading ability, than those just introduced to the book when entering the

formal school age. (OECD, Let's Read Them Story! The Parent Factor in Education, 2012).

To increase reading interest, Indonesian children's book development needs to be done. Indonesian folklore is now losing its existence, but it is still needed as a means of character education, therefore character design is essential in developing storybook for children.

2. LITERATURE AND THEORY

2.1 TYPES OF INDONESIAN FOLKLORE

Folklore is the story of ancient times who lives among the people and passed on orally (Setiawan, 2016). Folklore is part of traditional literature and is a form of cultural expression of the region. Folklore has a very large number throughout Indonesia with distinctive areas respectively. The regional language that became the media of oral tradition is also part of traditional culture. Folklore divided into three major groups ie Myths, Legends, and Fairy Tales (Endraswara, 2013).

Myth is one of the old types of stories that are often associated with origins, places, gods, or other supernatural forces that transcend the limits of human ability. The myth is presented with an interesting story that contains action, a tense event, and is seen as something sacred and not necessarily true (Nugiyantoro, 2015).

Legend is an ancient folklore that has some connection with historical events. (Setiawan, 2016). Legends are similar to myths that also include part of folklore. The distinction between myths and legends is never clear, both of them show interesting stories with great figures who are beyond the limits of human ability. The difference between the myth and the legend, the legend presents the characters, events, or places that have real historical truth (Nugiyantoro, 2015).

The tale is a fantasy story that did not really happen. Fairy tales are told primarily for entertainment, although many also portray the truth, containing lessons (moral), or even satire (Zulfahnur, 1996).

2.2 CHILDREN CHARACTERISTIC

In general, a child has a rich fantasy, children are also happy to tell by exaggerating about his experiences, or even ask for things that are unseen. This happens because the child's imagination grows beyond what he sees. Kids also have a short

attention span. Children will find it difficult to stay focused on one thing for a long time. Children's attention is easily distracted, unless the activities he or she is doing are attracting attention.

Childhood is the most potential learning period, the childhood period known as golden age, the period in which children experience a variety of growth and rapid development and rapidly on various aspects of development. So at this time children really need stimulation and proper stimulation from the environment (Jurnal Pendidikan Anak Usia Dini Volume 7 (JPAUD), 2013).

2.3 CHARACTER STUDY

In designing a character for a story, things to note is the profile figures such as name, gender, species, age, temperament, and most importantly the context of the story. The strong visual form of the character is that it can slightly explain the character of the character in the story even without reading the description in the story.

The development of the story may affect the appearance of the characters, and vice versa. Figures are made without regard to the context of the story is simply a design without a character, as shown in Fig. 2 (Nancy, 2007).

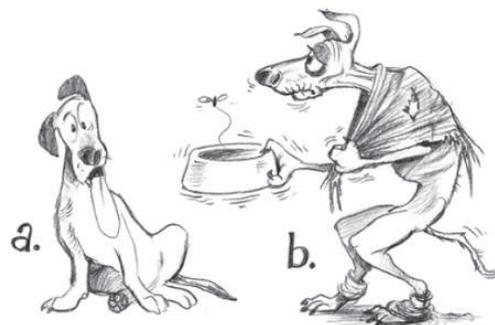


Fig 2. Design of a Dog Character (a) Without Character (b) With Character, Age, And Attitude

The important thing to consider in designing a character is to give one or two dominant traits easily identified by the children to the main characters. Character traits can be shown through text as well as illustrations. Using illustrations and avoiding the use of text to describe character details is most appropriate (Association, 2006).

2.4 COLOR PALLETE FOR CHILD

Pre-school age children are very sensitive to eyesight on the color of objects that are interesting

and striking. The red color (Pantone Warm Red C), purple (Pantone 2577 C), yellow (Pantone Yellow 012 C), blue (Pantone 300U) and green (Pantone 388 C) have an effective impact on the development of the ability to build the level of vision concentration to be stored in the child's brain memory is good and durable. (Harun & dkk, 2009).



Fig 3. bright palette color

Colors have also a very strong emotional power, the most important thing to note is choosing colors and combine to promote the purpose of publication (Rahayu, 2013). In children books, there are several color combinations that match the characteristics of children:

Romantic Color Combination



Fig 4. Romantic color palette

Romantic color palette give the impression of calm and comfort in the heart, because the combined of pastel colors. The combination of each color expresses the impression of cute, sweet, cheerful, and fairy tale-like. In addition, romantic colors can also reinforce the impression of happiness, youth, and innocence.

Playfull Color Combination



Fig 5. Playfull color palette

Playful colors consist of strong and cheerful colors such as bright yellow, bright blue, orange, and so on. This color gives the impression of a hot and

sunny tropical climate, or candy colors like lemons and strawberries (Eiseman, 2000). In addition, playfull color combinations also symbolize liveliness, passion, excitement, and attention (Whelan, 1997).

Cool Color Combination

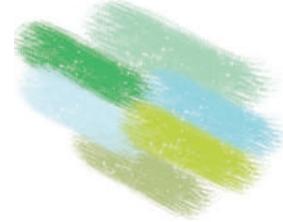


Fig 6. Cool color palette

Cool colors combined from each group of colors that express the impression of a clean, pleasing, refreshing, and clear. The main color in this combination is the blue color with white and yellow as a support (Eiseman, 2000). In addition, this combination is also synonymous with green, both old and young, greenish yellow and bluish green. Cool colors depict nature, comfort and peace of mind (Whelan, 1997).

Tropical Color Combination



Fig 7. Tropical color palette

Tropical color palette of basic colors combined with other colors that are opposite each other and can be arranged at will. The combination of intense tropical colors with red, then yellow and brown are identical to the heated atmosphere, bright, cheerful, and excited. In addition, this color combination also refers to the color of flowers, birds, and tropical fish (Eiseman, 2000).

Festive Color Combination



Fig 8. Festive color palette

This color combination is dominated by yellow and blue. Yellow represents a bright impression, while giving a clean impression. When yellow and blue combined with bright colors, will create the impression of an active and sporty atmosphere (Eiseman, 2000).

CONFLICT FOR CHILDREN BOOK

Making story conflicts on children books, limit the story to one of the conflicts that must be overcome and can be handled by the main character. The most common types of conflicts in folklore are individuals vs. individuals, individuals vs. societies, individuals vs. nature, and individuals vs. self. Some of the common problems of children are acceptance by others, family dynamics, physical growth especially size and appearance, and fear of the unknown like learning something new, participating in a new activity, going to a new place, and getting lost (I.R Accociation, 2006).

STORYLINE

The storylines are important to create a good book for children. Stories are presented directly to the main conflict, whereas conflict resolution must contain lessons or messages that should not be told in a straightforward manner but rather presented indirectly through the plot. The use of flashback stories should be avoided as they may confuse children (I.R Accociation, 2006).

ILLUSTRATION FOR CHILDREN

Some children's books have illustrations on the front cover that present the main conflict or place of story. Illustrations are usually made after the story text is written and serves as a partner for the text. The illustration model is presented differently depending on the target audience (I.R Accociation, 2006).

A storybook intended for children ages 0-2 years contains introduction of concepts such as letters, numbers, colors, etc. Presented in the form of images with a single object that is big and flashy and without words as seen on figure 6 (Anderson, 2006).



Fig 9. Children book illustration for 0-2 yo

For children between 3-6 years old the illustrations are presented in the form of stories with more text. The book category for children this age is children's song books, numeracy learning books, alphabet book, to picture story books (Reitz, 2008).

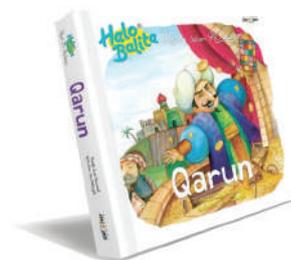


Fig 10. Children book illustration for 3-6 yo

Children between the ages of 7-12 years who have started reading for study, illustrations are made with more complicated and interesting images but with fewer numbers because of more full text (See Figure 11). at this stage, children can read a fairly long duration with the number of pages more. Category books for children aged 7-12 are the fiction, fantasy, and general knowledge. In this condition, children aged 7-12 years begin to grow their motivation in order to fulfill their reading motivation (Zulkifli, 2009).



Fig 11. Children book illustration for 7-12 yo

3. DATA AND METHODS

A researcher conducting an interview with a psychologist is used to validate the previously obtained data by reference. Information gleaned

from the literature search process and interviews with Mrs. Sinta Yudisia Wisudanti, SPsi i.e:

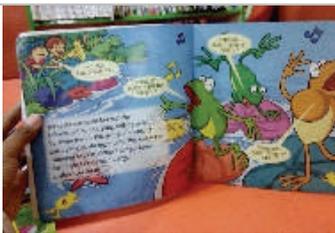
1. Toddler is a period before childhood, while the child is before pre-teen years.
2. Everyone loves novelty (something new), especially children
3. Children tend to like things that are fun, gentle, and entertaining. Although it is possible that it depends on the personality of each child.
4. The toddler book consists of 16-20 pages.

EXISTING STUDY

Existing studies were conducted to collect references to existing picture books. The results of this study are used as a reference in making the design of characters on the telaga warna story.

Table 1. the result of existing study

N O	CHILDREN BOOK	EXPLANATION
1.	 Cerita Rakyat Nusantara 7, Erlangga, 2013	50% text 50% images full text heavy & long story the main character isn't always shown
2.	 Cerita Rakyat Nusantara 1, Erlangga, 2008	50% text 50% images full text heavy & long story the main character isn't always shown
3.	 Cerita Rakyat Indonesia Sabang – Merauke, Andi	70% text 30% images full text heavy & long story the main character isn't always shown

	Publisher, 2011	
4.	 Cerita Rakyat Nusantara 4, Erlangga 2006	40% text 60% images full text heavy & long story the main character always shown
5.	 Kokiwa dan Sapi-sapinya, Gramedia Pustaka Utama 2010	15% text 85% images full text heavy & long story + callout on the character
6.	 Mengapa kodok bermain musik, Bestari Kids 2008	15% text 85% images full text heavy & long story + callout on the character

REWRITE PROCESS

The selection of folklore titles is limited by consideration of the content contained in the storyline as well as the moral message in it. Some of the things that need to be avoided are violent content, pornography (adult), physical abuse, and contrary to early childhood education curriculum.

Selected national folklore is made with a more concise flow and can be understood by the target audience. After the story is made, the next is to make a handy script to make storyboards easier and as text in children's books..

Table 2. rewrite process for Telaga Warna folklore

<p>The Origin of Telaga Warna (Folklore Nusantara from West Java)</p>	<ol style="list-style-type: none"> 1. In a prosperous and peaceful kingdom there lived the happy king and queen. One day, the king prayed to God to be immediately blessed with a child. 2. A week later, the queen became pregnant and eventually gave birth to a beautiful daughter named Princess Rukmini Gilang 3. Princess Gilang Rukmini grows up to be a badly behaved and very spoiled child 4. On the birthday of the princess, the royal folk give the princess a colorful necklace gift. The necklace is made of gold and gemstones. 5. But the princess even throw the necklace to pieces and scattered on the ground 6. Kings, queens, and people cried until their tears flooded the palace. Suddenly the water in the soil came out rapidly and formed a beautiful and colorful lake known as the Telaga Warna (lake of colour)
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The result of rewrite story on Telaga Warna made and the final result is quite clear and no dialog required on the character, so no callouts are required.

ENVIRONMENT BACKGROUND STORY

Story Origin Telaga Warna color comes from West Java which in general the environment background used is the kingdom. Reference background is taken the palace buildings that accented typical western Java.



Fig 12. Jawa Palace as reference for environment background

In addition to the palace, there is also Telaga Warna which is the main background of the story. The shape of Lake Color is realized by reference to the original image. In order not to be too rigid, in this story we also added some properties such as trees and plants with a variety of colors to look more colorful in accordance with the title.



Fig 13. Actual Picture of Telaga Warna

4. RESULT AND DISSCUSSION

LAYOUT

Layout or layout design greatly affects a message in a design. When media containing information is delivered in a bad layout, people will be reluctant to see it.

Basically, in the making of children's books do not usually refer to one type of layout, but the majority

use the type of Z-layout (zig-zag pattern). The zig-zag layout method has a fairly easy and simple read flow, so children will have no difficulty in accessing information on books that use zigzag patterns.



Fig 14. Z-Layout application on Telaga Warna children’s book

The main concerned in the layout arrangement is the placement of text that is located on the space area and only on the same side on each pages so it does not seem overlapping with the main character illustration.

COLOR

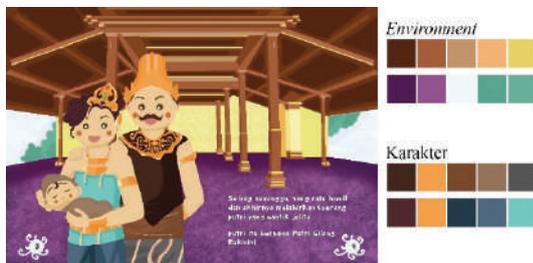


Fig 15. Pallete color used in Telaga Warna children’s book

The color palette Origins story Telaga Warna shown in Figure 15. The colors are taken in the story is not too much, on average only utilize interval monochrome color of the main color. The colors on the enviroment tend to be more soft and soft, while the colors for the characters use warmer colors and bold.

CHARACTER DRIVEN AND DESIGN

In the origin story of Color Telaga, there are 3 main characters namely King (Prabu Suwartaalaya), Queen Purbamanah, and Princess Gilang Rukmini, with additional baby princess Gilang Rukmini.

1. The King

In the making of the character of the king on the story of the origin of Telaga Warna, the reference used refers to other king figures from West Java, because there is no reference depicting the character of King Prabu Suwartaalaya (the king in the origin story of the color lake). In the story of the Origin of Telaga Warna, King Suwartaalaya is told to be kind and lovable to his people.



Fig 16. The King character references

Determination of the king's costumes to accessories adapted from reference results, it aims to describe the character of the king in the story that came from West Java. King's crown was made long and tapers at the top the same as that charged kings in West Java. To highlight the impression of nobility, the crown of the king is given a golden yellow color, as well as on the bracelet as shown on Fig.17.

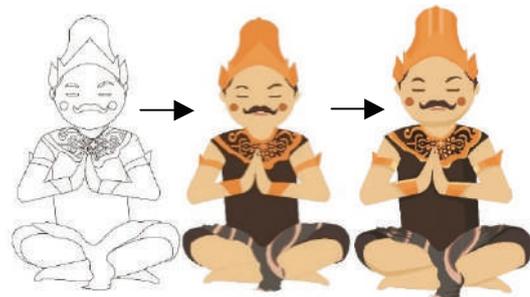


Fig 17. King Character (Prabu Suwartaalaya)

2. The Queen

Queen in the story of Origin Telaga Color named queen Purbamanah, namely a queen who is patient and compassionate. Similar to King Suwartaalaya, the figure of the queen purbamanah is not widely depicted in various references. To create the queen of Purbamanah, we used some reference of queen costume from West Java as depicted in Figure 18.



Fig 18. The Queen character references

Purbamanah queen embodiments only refer to the reference. The figure of the queen is depicted using *dodotan* and *jarik*. Crown accessories, necklaces, bracelets, and belts made of gold are added to give the impression of nobility as shown on Fig 19.

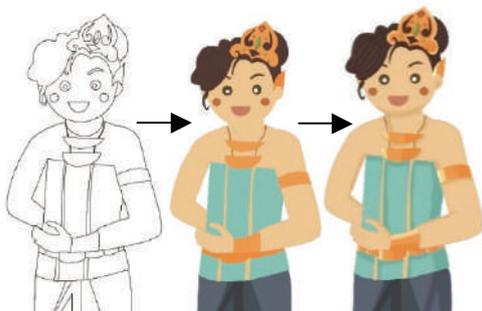


Fig 19. The Queen character (Ratu Purbamanah)

3. The baby of Princess Gilang Rukmini



Fig 20. The baby character reference

Baby of princess Gilang Rukmini is depicted in the form of a baby girl, there is no special character in her appearance. Only the addition of a *bedong* clothes to look further highlight the traditional sense as shown on Fig 21.



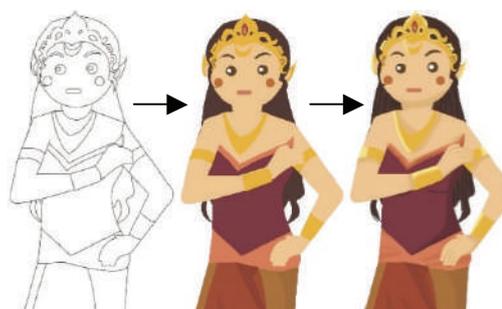
Fig 21. The baby of Princess Gilang Rukmini

4. Princess Gilang Rukmini



Fig 22. Princess Gilang Rukmini character reference

Princess Gilang Rukmini in the story of the Origin of Telaga Warna is described as a king daughter who behaves badly and spoiled. To depict the daughter was not good, then the daughter facial expression made to not really cheerful. Together from the king and queen, daughter Gilang Rukmini also embodied wearing jewelry accessories such as crowns, necklaces, and bracelets as shown on Fig 23.



Gambar 23. Princess Gilang Rukmini Character

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REFERENCES

"JPNN.com Jaringan Berita Terluas di Indonesia", PT JPG Multimedia, 8 Juni 2016. [Online]. Available: www.jpnn.com. [Accessed 28 Desember 2016].

"CNN Indonesia Student", Trans Media, 27 Juni 2016. [Online]. Available: <http://student.cnnindonesia.com>. [Accessed 19 Januari 2017].

OECD, *Let's Read Them Story! The Parent Factor in Education*, Paris: OECD Publisher, 2012.

Dirjen PAUD &. *Pendidikan Masyarakat, NSPK (norma,standar,prosedur,dan kriteria petunjuk teknis pengajuan,penyaluran dan pengelolaan bantuan TBM rintisan*, Jakarta: Direktorat Pembinaan Pendidikan Keaksaraan dan Kesetaraan, 2013.

F. Glebas, *Directing the story*, USA: Elsevier, 2009.

B. Nancy, *Prepare to Board! Creating Story and Characters for Animated Features and Shorts*, United Kingdom: Focal Press, 2007.

R. McKee, *Story: Style, Structure, Substance, and the Principles of Screenwriting 1st Edition*, New York: ReganBooks, 1997.

E. Setiawan, ""Kamus Besar Bahasa Indonesia (KBBI)"" [Online]. Available: <http://kbbi.web.id>. [Accessed 29 Desember 2016].

S.Endraswara, *Folklor Nusantara : Hakikat, Bentuk, dan Fungsi*, Yogyakarta: Ombak, 2013.

B. Nurgiyantoro, *Sastra Anak : Pengantar Pemahaman Dunia Anak*, Yogyakarta: Gadjah Mada University Press, 2005.

d. Zulfahnur, *Teori Sastra*, Jakarta: Departemen Pendidikan dan Kebudayaan, 1996.

E.B.Hurlock, *Child Development*, New York: Mc Graw Hill Book Company, 1993.

Zulkifli, *Psikologi Perkembangan*, Bandung: PT Remaja Rosdakarya, 2009.

K. Kartono, *Psikologi Anak*, Bandung: Alumni, 1979.

Jurnal Pendidikan Anak Usia Dini Volume 7 (JPAUD), Jakarta: Program Studi Pendidikan Anak Usia Dini Program Pascasarjana Universitas Negeri Jakarta, 2013.

I. R. Association, *Tips for Writing a Children's Picture Storybook*, 2006.

S. Rustan, *Layout Dasar dan Penerapannya*, Jakarta: PT Gramedia Pustaka Utama, 2008.

W. Lidwell and dkk, *Universal Principles of Design, Revised and Updated*, USA: Rockport Publishers, 2010.

S.Rustan, *Font & Tipografi*, Jakarta: Gramedia Pustaka Utama, 2010.

R. Harun and dkk, *Asesmen Perkembangan Anak Usia Dini*, Yogyakarta: Multi Pressindo, 2009.

N. Rahayu, *Desain Multimedia 2*, Jakarta: Kementrian Pendidikan dan Kebudayaan Republik Indonesia, Direktorat Jenderal Peningkatan Mutu Pendidik dan Tenaga Kependidikan, 2013.

L. Eiseman, *PANTONE, Guide to Communicating with Color*, USA: Graftix Press, Ltd, 2000.

B. M. Whelan, *Color Harmony 2 : a Guide to Creative Color Combinations*, Rockport Publisher, 1997.

in *The ALA Glossary of Library and Information Science*, American Library, 1983, pp. 41-42.

N. Anderson, *Elementary Children's Literature*, Boston: Pearson Education, 2006.

J. M. Reitz, "ODLIS — Online Dictionary for Library and Information Science," 16 June 2008. [Online].

The Design Of “Pos-ID” Board Game for Ages 9-12 Years as Effort to Build Awareness of Services and Products of Indonesian Postal

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Abstract—Post Office is a state-owned company engaged in the postal service, logistics and counter payment. The emergence of private companies in the field of logistics with faster delivery up to and guaranteed to cause a decrease in the number of users of products and services Pos Indonesia (brand name of Indonesian Postal). This raises the urgency to rebuild public awareness of Pos Indonesia and introduce the growing Pos Indonesia products and services through new media in addition to TV commercials, brochures and events, board games. The design of this board game is done by experimental research method, depth interview, field observation, and questionnaire. All the research results will be analyzed to get the concept of board game design that can introduce products and services Pos Indonesia. The game is expected to raise children's awareness of the services and products of Pos Indonesia.

Keywords – *Awareness, Products and Services, Pos Indonesia, Introduction*

1. INTRODUCTION

Pos Indonesia (Persero), is a state-owned enterprise engaged in the postal service. The modern postal emerged in Indonesia since 1602 from the time of the VOC in Indonesia. The development of technology and information is increasing rapidly. In 1994, the internet entered Indonesia. The Internet grew in popularity in the 2000s.

Communication becomes easier with e-mail or email, and messages are more easily communicated with the presence of chat apps like LINE, Whatsapp, etc., so do physical mailing activities (such as correspondence, postcards, etc.) begin to diminish. This is overcome Pos Indonesia by creating new services in the form of logistics delivery. However, based on the 2014 annual report of Pos Indonesia, people are more entrusted with

other logistics services, such as JNE and TIKI because the delivery of goods and packages through private logistics services tends to be faster to the destination.

Pos Indonesia has had various media as a form of promotion and socialization in helping Pos Indonesia performance. Pos Indonesia has also released television commercials in 2014 and prints brochures that are placed in every post office.

At Central Post Office Kebon Rojo Surabaya, during the school visit to the Post Office, elementary students will be invited to play a snake ladder containing Post Office content, where the child will play a letter letters. The board game consists of a 5m x 5m playing field (divided into 25 squares), and a 50cm x 50cm x 50cm cube-shaped dice. The game play on the

board of the game is the player acting as the letters represented as his own becoming a piece, then the player will throw the dice and move forward according to the dice numbers that come out. When a player climbs a column marking a sent letter, then they are entitled to step higher, but if players climb the column indicating that the letter failed to be sent, then they are obliged to descend to the lower column. The player who reaches the finish line will first come out as the winner.

Therefore, a new media on the introduction of Pos Indonesia products is needed to build public awareness, especially children about Pos Indonesia. Target targeted is children aged 9-12 years, because at that age the child will be implanted knowledge about products and services of Pos Indonesia so that at the age of decision making, they will choose Pos Indonesia as the main choice in sending physical objects.

Board game needed to build awareness of Pos Indonesia is board game that can be included element of more deep introduction about Postal products and services, and able to build sensitivity to Pos Indonesia. Board game is also expected to meet the needs of children in biological, cognitive, social, and other aspects.

2. LITERATURE REVIEW

2.1 Board Game Theory

Board games can be an alternative in improving children's intelligence. By playing, children can develop an emotional social aspect. When children play a sense of belonging, feel part of a group, and learn to work together in a group. By playing in groups, the child will also learn to adjust his behavior with other children, learn to master himself from his ego, learn to restrain himself, be able to manage his emotions, and learn to share with others. From the emotional side, the unspoken desires are also increasingly formed when the child is playing imagination and sociodrama. (Kartini, 2002, p.120-121)

2.2 Brand Awareness Theory

According to Professor Kevin Lane Keller,

brand awareness is the ability to identify brands in different situations, including knowing brands and re-branding. This famous branding expert believes that brand awareness is very important because it increases the likelihood that the brand becomes part of the consumer's mind and is selected from a set of existing brands to be consumed in the future.

Brand awareness can be done for several purposes. For new products, brand awareness is done with the aim to awaken consumers to the existence of such products in the market. As for the products that have been in the market, brand awareness is done to maintain the brand in the market and build a ceiling in the development of new products, or even restore consumer awareness of a brand that has lost competitiveness with other brands.

In the growth stage of the child, their brains are still developing so as to have difficulty distinguishing between the appearance of advertising and reality, so the ads can disrupt the children's view of the world, in addition, children have not been able to adequately evaluate the claims offered by the brand.

At the same time, marketers also need to know that children are increasingly becoming an important part of demography because of their own purchasing power, their ability to influence adult purchasing decisions (parents), and of course they are future adulterers. On the basis of these things, honesty in marketing strategy to segment the child is very important.

3. DATA AND METHODS

3.1 Research Method

- **Depth Interview**

Depth Interview conducted to get input from experimental research that has been done. Input from the depth interview will be taken into consideration in designing the board game of Indonesian postal products and services. The source person is the stakeholder, namely the representative of PT. Pos Indonesia and related parties in this design.

• **Literature and Existing Studies**

In the literature study part, the authors use several sources of literature as the source of Pos Indonesia's performance data and to obtain important information used as supporting data in the design.

• **Observation**

Observations conducted to determine the extent of knowledge of children about Post Office, services offered by Post Office, and knowledge of children about Post Office products. Observation also aims to determine the knowledge and interests of children about the board game. In the observation stage, the writer invites the child as the target audience to play some board game that is UNO, Snake Ladder and Monopoly.

• **Questionnaire**

The questionnaires were distributed to students of grade 3,4,5 and 6 elementary schools and distributed in three different elementary schools, namely Yamastho Islamic Elementary School, Al-Azhar 11 Islamic Elementary School and SDN Ketabang I. The questionnaires were conducted to get more information about the knowledge of services and products Pos Indonesia and student responses on board games. The questionnaire also serves to obtain design criteria that match the target audience.

• **Experimental Research**

Experimental research is conducted with the aim of finding the suitability of design criteria as the basis in board game design. Experimental research conducted in the form of test play to the board game community about gameplay, test play on the Pos Indonesia tourism section on board content, and user test on the target audience of elementary school children aged 9-12 years. Test play against the board game community is held three times, test play against board game community aims to determine the right gameplay and easy to play. Test play is second to the tourism section of Pos Indonesia as a stake holder, aims to determine the needs of the content to be conveyed to the target

audience and will be the board game content. Test play with the target audience aims to determine board game criteria.

3.2 Sampling

In board game design, the target audience is elementary school students grade 3,4,5 and 6, by Geographic segmentation is children aged 9-12 years old or average age for students who are in grade 3,4,5 and 6 elementary. Sampling was conducted on Yamastho Islamic Elementary School students, Islamic Elementary School Al Azhar 11 and SDN Ketabang I Surabaya.

3.3 Sample Responden

- Number of respondents: 103 children.
- Sex: Male and female.
- Age: 9-12 years old.
- Education: Elementary students grade 3,4,5,6.

4. RESULT

4.1 Colour Palette

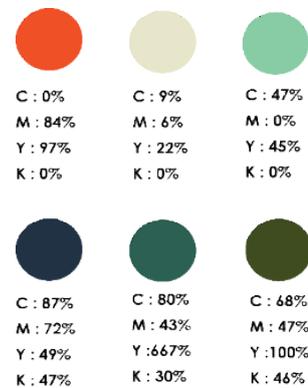


Figure 1. Color palette used in game board design

In the color selection in Pos Indonesia board game, the selected color is taken from the color of the famous tourist spots on each island in Indonesia which became the destination destination of goods delivery, in addition to the background color of the card using blue as the color of the sea from the map of Indonesia. To get strong impression about Pos Indonesia brand, there are orange or orange color taken from color palette of Pos Indonesia logo so that player can immediately recognize color of identity of Pos Indonesia.

4.2 Typography

The selected font is a font which has a clear readability level, with a font style that appeals to the child. Font size for each caption and headline writing ranges from 9 pt-14pt. The following fonts are used in the Pos Indonesia Board game

4.3 Visual Style

Tintin cartoons are the reference reference in drawing due to the theme that match the board game, that is the adventure to explore the island of Indonesia through the delivery of the shipment.

4.4 Design Implementation

The following are a design implementation based on design criteria.

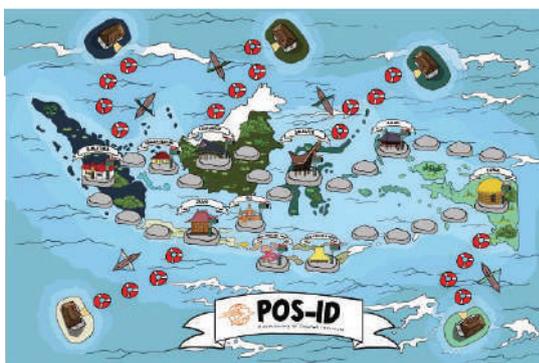


Figure 2. Main Board

The board has a visual map of Indonesia, indigenous houses of Indonesia and Post Office. Post offices outside the island is a starting point, while traditional houses on each island are a point to complete the mission of the shipment.



Figure 3. Pawns

The pawn in this game serves as the representative of each player's step on the board game. Each player will be represented by a pawn. The number of pawns in this game are 5 pieces with different poses of Postman.



Figure 4. Cards

Game cards are a major component in the Post-ID board game. The cards will be the main mission that must be completed by the player, while other cards are supporters and tools in adding points. Card design has layout criteria, layout in the form of main illustration, color as island identity and text as information description.

In this game, there are 4 types of cards, namely island cards, mission cards, resource cards and event cards. These 4 cards are distinguished by the color of the back of the card, the card layout and the content inside. In this game there are 128 cards consisting of 25 island cards, 68 mission cards, 10 event cards and 30 resource cards. The size of the card is made one size that is 6.3 cm x 8.7 cm. The size is chosen because it uses standard card sizes and clear legibility levels for children. Here is the design of each card.



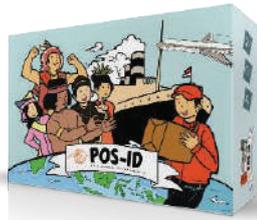
Figure 5. Dices

This game uses 2 pieces of dice with different functions, the first dice is the main dice used to determine the pawns of each player. The main dice has 6 sides showing 6 different numbers on each surface, while the second dice is a 8-sided dice to be used when the player gets a card for the chance to use the dice with 8 sides.



Figure 6. Stamp Tokens

In this game, there are 150 stamp tokens consisting of 100 stamp tokens worth 1 point and 50 token stamps worth 3 points. The function of this stamp token is as a tool that has an exchange rate to acquire the island and win the game.

**Figure 7. Packaging**

Packaging is an element used as a container to unite all components in one place so that the game can remain intact into one. The packaging design is compact box in order to accommodate all components of the game. The game pack contains content about game titles, illustrations, game short descriptions, game component content, game length annotations, player count and player age.

5. DISCUSSION

5.1 Conclusion

The board of Post titles is a medium aimed at introducing Pos Indonesia services and products to children and helping children in raising awareness of the services and products of Pos Indonesia, in accordance with the theory used in Brandchild research [5], where In building awareness of a brand, the child must be directly involved with the brand in their daily life. Board game is an introductory game media for children aged 9-12 years or elementary school students grade 3,4,5 and 6 SD, gameplay that is used is role playing, where child will role as courier delivery or Postman.

At the beginning of the board game game explanation, the child is easy to understand the function of each component of the game, but

there are some questions about the function of several different cards. Execution of board game mechanisms is more effective when explanations are made while practicing the game. The most interesting part is the part where players can exchange their stamp tokens with island cards, because the island card is the deciding card of victory.

Based on post test result, data of children's knowledge about Pos Indonesia's products and services are increasing. Before beginning to play, children will be asked questions about knowledge in the field of services and products of Pos Indonesia. The duration of the game ranges from 45 minutes to 60 minutes.

The obstacles found in the play are, the different goals of the player. One player has another goal in achieving the goals of the game, the player is more interested in collecting the stamp token than spending it, so the player is bored because the goals are not reached and tends to lag behind other players who have successfully redeemed their stamp tokens with island cards.

5.2 Suggestion

Suggestions for future design are expected to expand in the content more broadly, for example services and products of Pos Indonesia in addition to delivery services, but also as a place to pay utility bills, taxes STNK, BPJS, financial services, etc. Content contents are expected to lead to the more remote islands in Indonesia, because the superiority of Pos Indonesia is its ability to deliver goods to remote areas in Indonesia.

From the visual point of view, based on the test result, the children understand visuals of Pos Indonesia services and products such as stamps, letters, remittances, packages and motorcycles, but there is one product that escapes children's knowledge either before playing board games or after playing board games, The postcard, this is because the child was born in an era of technological development where physical objects such as postcards are rarely used. Therefore, for the future visual is expected to be more clearly communicate.

In terms of gameplay, there is a probability that the child is bored because it does not meet the goals, because the child is more interested in collecting stamp tokens than spending it, to avoid the possibility of players who are bored, then the points for the exchange of island cards will be deducted from the specified amount, Shorten the duration of the game and for a faster winner to be determined.

Board game is planned to be made series continued in some options, that is after the theme of sending goods to all over Indonesia, the theme of the next board game is to send the goods to the world. The contents of game content and game gameplay can also be further developed, from more varied game styles and broader content, allowing further researchers to continue the game with the theme of introducing services and products of Pos Indonesia.

REFERENCES

Report

Annual Report 2014 PT Pos Indonesia (Persero)

Stand-alone Web document

Kembangkan Memori, Fokus dan Logika. Retrieved July, 12, 2017 from www.ayahbunda.co.id

Mekanisme Board Game. Retrieved July,11 2017, from www.boardgame.id.

Membangun Loyalitas di Segmen Anak. Retrieved December 11, 2016. From www.marketing.co.id

Journal article

Zahira, Coniesyah Zalfa & Denny Indrayana S. "Perancangan Board Game Pos-ID Untuk Usia 9-12 Tahun Sebagai Upaya Membangun Kesadaran Terhadap Jasa dan Produk Pos Indonesia" (2017). Jurnal Ide

The Implementation of Educative Maritime Concept on the Interior Design of Daycare as the Facility Support for Child Growth

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Abstract— Every child has a “Golden Age” phase in the process of growing between the ages of 0-6 years. At this time every parent will certainly provide education and supporting facilities in accordance with the age, so that children's intelligence can grow optimally. However, parents who work in the company experiencing child care constraints, so they require a temporary child care facility, called daycare. Daycare has an important role to support the development of cognitive, affective, and psychomotor aspects in children, so it must have an interesting interior design concept. One suitable aspect applied to the concept of daycare is maritime aspect. Looking at the maritime sectors which become one of a major force in Indonesia, it will be very interesting to apply as a concept of learning and introduction to early childhood through playground and fun learning in daycare. The realization of the educative maritime concept can be formed in furniture adapted from marine biotas. The dominant blue color as a part of applying underwater themes combined with pastel colors. Cartoon characters type of children is also introduced as aesthetic elements that stimulate activity and pleasure.

Kata kunci – *Daycare, Interior design, Children, Maritime, Educative*

1. INTRODUCTION

Nowadays, in terms of employment in Indonesia, employees are required to participate very actively in the company. In this case, parents experience child care constraints in their active work hours. Though, underage children would need intensive care, especially the role of mothers in the golden age between 0-6 years. Golden age is the phase in which the brain experiences the fastest growth (80%) in its development. Brinet, Freud, and Watson in (Nuryanti, 2008: 4) suggest that parenting is the determination factor of child development. So we need a place that can provide temporary child care services that can support the development of children. This is what supports the establishment of child care facilities in groups called 'Daycare'. The

United Nations (1990) states, "Daycare is an organized effort to nurture children outside their homes for several hours in a day when parental care is less practicable."

Daycare therefore has an important role to play in providing services related to the children's rights to grow and develop, obtain protection and affection, and the right to participate in their social environment. Therefore, a design concept that is applied to daycare will give a new nuance that can stimulate the excitement and joy of children in play and learning process. In addition, the concept applied to a daycare help to create the branding of an ideal daycare.

In this study the selected concept for the interior of a daycare is the concept of 'Educative Maritime'. The concept of maritime is chosen by looking at the history of Indonesia as a maritime

country that plays an active role in the field of shipping and trading. In addition, diverse marine ecosystems and biota will be very interesting to be introduced to children of early age through designs, involving thematic cartoon characters. The concept of maritime is supported by educative concepts applied through informative and communicative spatial circulation, and the application of basic geometric shapes and colors that can have a positive effect on children development. Thus, the children will have a comfortable environment to play and learn.

2. THE METHODS

A. Data Collection Methods

Some data collection methods used for the research are observation method of existing field study, depth interview, questionnaire, and analysis of visitor requirement that aims to know the real condition of interior design that is exist.

B. Data Analysis Method

This stage is done by analyzing the data obtained in the existing area. From the results of this analysis then generate alternative designs, which will summed up to be the final design.

C. Stages of Design

Stages of design is the process of concept design and visualization. This stage begins with formulating problems, including literature studies, comparative studies, and design alternatives that are made covering space and facilities needs, circulation, visualization of shapes, colors, and other interior elements.

3. DISCUSSION

Maritime in the Indonesian dictionary (KBBI) is defined as anything pertaining to the sea, related to sea voyages and trade. While educative comes from the English word "to educate" which means educating (verb) to be educative (adjective) or education (noun). So educative can be interpreted as anything that is educational or related to education. The educative maritime concept applied to a daycare aims to give a new nuance to the interior space, by introducing the maritime component to the

early childhood that is applied in very simple way. This concept will also be able to stimulate the cognitive, affective, and psychomotor aspects of children's development through play and learning activities. In addition to meet the needs of children, this concept is also intended for daycare employee and parents to feel comfortable while staying in the room.

The following is the application of educative maritime macro concept for daycare interior:

- Visualizing maritime ambience through the appearance that stimulate children to be more active in playing and learning.
- Application of color (dominantly navy blue and pastel color) which affected on children's behavior.
- Application of basic geometric forms in children's learning media (furniture, aesthetic elements, and interior element).
- Implement an explorative and informative circulation that is simple and easy to understand for children.

1) The Ceiling Concept



Picture 1. Ceiling on daycare

Source: Author's Personal Design, 2017

Ceiling used in the concept of daycare is up ceiling and drop ceiling. This type of ceiling is chosen to give the impression of a broad and neat with different levels and lifting elements.

- Color



Picture 2. Daycare ceiling color

Source: Author's Personal Design, 2017

Navy blue and skylights color are applied to the ceiling in different spaces according to its needs. For example the navy blue color is more suitable to be implemented to the bedroom area, because it gives the impression of a darker color which is

calmer and not too flashy. While the skylights color can be applied to the lobby or playroom because it seems to be brighter and cheerful.

- Shape

The ceiling (drop ceiling and up ceiling) can be varied with some of aesthetic elements, such as cloud formation that describes the atmosphere of night sky in sleeping room.



Picture 3. Cloud formation on the ceiling
Source: Author's Personal Design, 2017

- Materials

Ceiling uses gypsum material because it is more flexible to use in various formations and the coloring process is easy. Simple ceiling design also serves to balance between the design of walls and floors that already have a lot of accentuation.

- Lighting

The type of lighting used in daycare is natural and artificial lighting. Natural lighting is obtained through the window in each room, while artificial lighting is obtained through downlight, TL, and hanging lamps. The type of lamp used is adjusted to the needs of each room.

2) The Flooring Concept

The concept of the floor consists of several aspects including:

- Color

According to the concept of educative maritime, the brown color is applied to give the impression of more spacious looks and sand beach atmosphere in a room. The brown color has a different style in each room, adjusted to the material used.

- Shape

Marital maritime characteristics can be applied through the accentuation of floor stickers that are formed to resemble the

waves with dominant navy blue color. In addition to wave formation, geometric shapes such as circles and squares arranged lined up to create a simple track/signage that connects two places to make it more playful.



Picture 4. Transformation of wave shape
Source: Author's Personal Design, 2017

- Materials



Picture 5. Daycare flooring material

Source: <https://www.google.co.id/flooring>

The flooring material used must meet the safety standards for children. Vinyl and ceramic materials are two materials which considered safe to apply. Vinyl material is chosen because it is more comfortable type of floor to walk, to sit, even to crawl, relatively durable, more flexible in the installation, and the usage range is about 10 to 15 years. While ceramic floor is chosen because it can be used for a long time, does not absorb water, has smooth surface, has various color, pattern, texture, and size, and can be combined with floor sticker.



Picture 6. Ceramic floor and sticker accentuation
Source: Author's Personal Design, 2017

3) The Wall Concept

The wall material in the daycare building made of concrete which can be combined with some installation of acoustic material, panels, and evamats in the room. As acoustic materials, it will keep the noise inside the room and keep children safe while on the active move. A simple but interesting idea that can be applied to the wall is a cartoon character mural/wallpaper that related to maritime theme. The children at the age of 0-5 years are at the very active stage to imitate or adapt the behavior of the people or things around them. So the interesting cartoon characters part just like the expression, moves, and activities are visualized in order to provide a positive stimulation.

- Color



Picture 7. The colors of daycare walls

Source: Author's Personal Design, 2017

These primary colors above are applied to the wall in accordance with the concept of educative maritime. There are the color of navy blue, skylights, and white. Accentuations in the form of typography can be implemented to add a dynamic impression in a room.



Picture 8. The wall concept of daycare

Source: Author's Personal Design, 2017

4) The Concept of Furniture

Furniture used in daycare must meet some safety standards for children.



Picture 9. Furniture for children

Source: <https://www.google.co.id/furnituranak>

- Shape

Some furniture that is safe for children using dull edgeless furniture. The material that has a direct contact with children's skin should have a smooth texture level and be able to minimize the impact when the children are on the active move. In addition to the safety, furniture can be designed with maritime characteristics such as boat-like shapes, marine biotas (fish, whale, octopus, kelp, coral, etc), and marine ecosystems.

- Materials

The furniture is using wood materials, MDL, multiplex and aluminum. Some of the finishing materials are duco paint and HPL. The safest finishing for children is nitrocellulose finishing because it is made from natural and odorless material. Materials such as evamats can be used as a protector because it has soft texture.

- Color

Color applied to the furniture is very diverse. This is intended so that children can learn to explore and discover various colors that are good for their psychological development.



Picture 10. Study color of furniture

Source: Author's Personal Design, 2017

- Dimension

The size of furniture made to adjust the

body dimensions of children between the ages of 0-5 years. The following is a divergent dimension of boys and girls.

Dimensi	Keterangan	Mean anak pria (cm)	Mean anak wanita (cm)
6	Tinggi kepala tangan yang terjulur ke bawah dalam posisi berdiri tegak	47,17	45,82
8	Tinggi kepala tangan ke atas dalam posisi berdiri tegak	130,31	125,30
9	Tinggi jangkauan tangan ke atas dalam posisi duduk tegak	79,01	76,40
21	Tebal/lebar paha	10,97	10,10
22	Panjang jangkauan tangan ke depan dari punggung sampai dengan kepala tangan	46,49	45,19
23	Panjang jangkauan tangan ke depan dari bahu sampai dengan kepala tangan	41,46	40,06
24	Panjang jangkauan tangan ke depan dari bahu sampai dengan ujung jari tangan	48,06	16,68
25	Lebar bahu dari kiri ke kanan	28,11	27,13
26	Lebar tubuh total termasuk lengan dari kiri ke kanan	33,03	32,06
27	Lebar pinggul dari kiri ke kanan	23,93	23,25
28	Tebal dada dalam keadaan membusung dari depan sampai belakang	15,08	14,84
32	Lebar telapak kaki	8,09	7,48
34	Lebar telapak tangan	6,94	6,55
35	Panjang telapak tangan	12,41	12,15

Picture 10. Anthropometric studies of children

Source: <http://journals.ums.ac.id/anthropometri>

5) The Concept of Aesthetic Elements

The aesthetic element used is a transformation of forms derived from maritime aspects such as ships, oars, anchors, round windows, etc. For example, the formation of a round ship window is applied to a mirror, or an oar-shaped hanger.



Picture 11. Transformation of form and function on aesthetic elements

Source: Author's Personal Data, 2017

6) The Concept of Colors

The main color chosen as the daycare identity according to the maritime concept is navy blue. Navy blue has three benefits for children psychologically such as making

sleep sounder, overcoming mild depression, and improving spirit or excitement.

Marysa IH, Anggraita AW (2016) says "The blue color and its kind symbolize a natural connotations that imply peace, calm, freshness, and purity and positive feelings". In addition to the navy blue, white is chosen as a counterweight of various different colors. It has a clean, airy, quiet, and neutral meaning whose value is very suitable to be applied in some daycare room.

In addition to the psychological aspects, the safety of painting materials is also a top priority. Paint used should have a low lead level for the safety of children.



Picture 12. Primary colors used in daycare

Source: Author's Personal Design, 2017

In addition to the dominant navy blue color, children also need a variety of colors as an introduction and learning. Color is also an important aspect that affects the children's brain development, emotional, and intelligence. Therefore, various colors combined with harmony into furniture, aesthetic elements, and interior elements.

CONCLUSION

The style of interior design can be the identity of a place. It is important to be applied for a daycare to meet the needs of educational, credibility, and a playful child care facility. The educative maritime design style has a fun, cheerful, and fresh characteristic that support the cognitive, affective, and psychomotor aspects in children. These characteristics can be directly applied to the interior of daycare, such as the application of the colors combination, cartoon characters type of children, the aesthetic elements transformation of sea creatures and ecosystems, etc.

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REFERENCES

Balai Pustaka. (2002). Kamus Besar Bahasa Indonesia. Jakarta: Balai Pustaka.

Hamdiani, Yulinda dan Dessy Hasanah Siti A, & Gigin Ginanjar Kamil Basar. (2016). Layanan Anak Usia Dini/Prasekolah dengan “Full Day Care” Di Taman Penitipan Anak. *Jurnal Universitas Padjajaran*, I (2): 155-291.

Hurlock, Elizabeth B. (1998). Psikologi Perkembangan, terj. Istiwidiyanti dan Soedjarwo. Jakarta: Erlangga.

Marysa IH, Anggraita AW. (2016). Studi Pengaruh Warna pada Interior Terhadap Psikologis Penggunaanya, Studi Kasus pada Unit Transfusi Darah Kota X. *Jurnal Interior Institut Teknologi Sepuluh Nopember*, I (1): 1-10.

Nuryanti, Lusi. 2008. Psikologi Anak. Jakarta: PT. Indeks.

Sobur, Alex. (2009). Psikologi Umum. Bandung: Pustaka Setia.

Tryphena, Angelia dan Gervasius HP, Rani P. (2015). Desain Arsitektur Interior Preschool yang Fun, Playful dan Edukatif. *Jurnal Interior Arsitektur Universitas Ciputra*, I (1): 36-61.

<http://www.parenting.co.id>, accessed on 15 February 2017, at 8.10 PM.

<http://www.bioindustries.co.id/standar-nasional-indonesia-untuk-cat-mainan-kayu-5650.html>, accessed on 15 February 2017, at 8.35 PM.

<http://journals.ums.ac.id/anthropometri.jpg>, accessed on 17 February 2017, at 7.51 PM.

<http://www.anakregular.com/2015/07/6-manfaat-warna-biru-bagi-kesehatan.html>, accessed on 17 February 2017, at 8.22 PM.

<http://www.tipshamil.web.id/2016/01/golden-age-masa-usia-emas-anak.html>, accessed on 18 August 2017, at 6.50 AM.

Boardgame Design about Early Aged Investation for Children

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Abstract — When a child reach an age on 9 years old, a brain ability, energy, intelligency of human have a very high development. In this aged, a child will be ready for learning an investation. The fun way of study could be applied in educational game, one of them can be found in Boardgame. The Research's Objective is Designing an interactive and atractive boardgame about early aged investation for child in 9 years old and older. The concept which will be applied is a fun educational boardgame about investation for children, in awhile, their experiences in the game can be implemented in their daily life.

Keywords – Early Aged Investation, Education, Boardgame, Habit

INTRODUCTION

The knowledge of Money in human life and their priority's management determining their priority to treat their money. Because all of those statements, the knowledge to treat their money and priority being a necessary to be known in an early aged.

Early aged or childhood is an aged or staged for a child reach a golden age that make them very active and energetic in study and play, which is their knowledge and experience that they got will be effected to their habit which will be doing an activity to build their personality until being an adult, because od that, the Learning method to a child must be suited with their development. Child's World is a world to play. From beginning, children like to study very much, but the way to study must be done in fun way (Mulyadi, 2006).

Board Game is a game which could pushing a player for detecting a path, planning and predicting a result for movement's alternative and learning from experience or an study model / mock up (Dewar, 2009 -

2012). Beside of that, from lately many years the popularity of Board Game occurs a high development in Indonesia. It was proved that the amount of Boardgame's community and many Board Game Cafe is to be built in some big town like Jakarta, Surabaya, Semarang, Jogja, and Bandung.

The object of this research is producing an output as a Boardagen design about Early Age Investation that easy to understand and atractive for children 9 years old with a hope can be applied in real daily life, so a child can build a habit and strategic mind flow.

DATA AND METHODS

Stage of Data Interpretation

For the first, to be held an field observation about an activity that consumed by a child and their perpective about money. Second is an observation about thei interest to a boardgame, than the result will be a primary data for design concetp arraging.

For supporting the data, holding an expert interviewing to the one who have many experiences in boardgame design to take a

Diagram 2. Design Concept

Objective tree is a table that have a function for determining keywords that can be objective thing in Boardgame design. Two keyword that researcher used are content, and context.

Content Necessary Analyst

Based on the study is be done by researcher about childre, study, play, and invest, The relationship between some point that explained before can be drawn as the content necessary of the game. And then, after arraging the main content, the next step can be doing is arraging the detailed content that can be applied in the concept and product. The related Point is how the early staged investation can be done by children for supporting the way they can learn and play, so they can remembered the experience they got in their reflective. The researcher try to plant an objective about early stage investation to the children according to what they can do now in their age, ability, and knowledge.

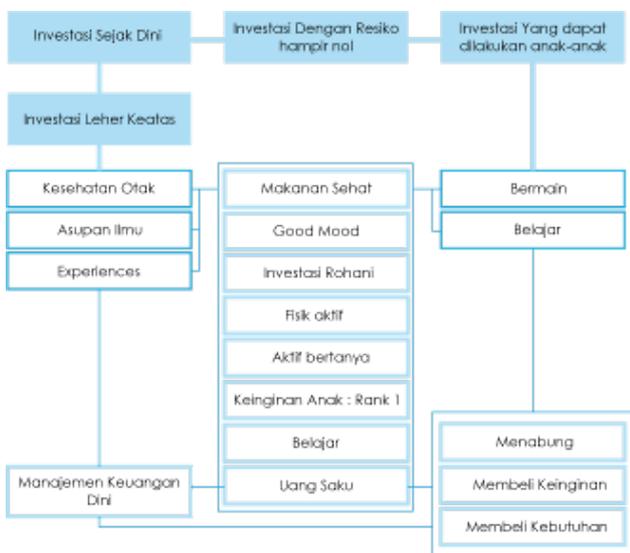


Diagram 3. Content Necessary Chart

Image Board and Persona

Image Board have a function for giving an illustration about the range, concept that have many simailarity with the design result of the product. So the product will stay in the range of persona and design's objeive. In this research, researcher used two image board for determining the product's style and the product's visual design, and the product design will be in minimalism style and playful.

RESULT AND DISCUSSION

STUDY AND ANALYST

Model and Play Test Analyst

This paragraph is the explanation of the Play Test Analyst that the researcher have been doing for getting a competible play game system with the objective of the design. In this analyst activity, the researcher give a test for some mock up boardgame design, the analyst and evaluation result for model 1,2, and to be prove in the table 1.

Table 1. Table of Test Play Evaluation

DEFICIENCY	REPAIRMENT
MODEL 1	
First model have been made for finding play game system for searching an error thing in the game and to be ready for getting total repaired. So, many clean paper and fulfilled by handlettering.	
Figure 1. Model 1 boardgame	
▪ Too many	▪ Differentiating

<ul style="list-style-type: none"> ▪ components ▪ Too small components ▪ The writing is not clear ▪ Difficult to distinguish between islands ▪ There are still many unnecessary components 	<p>the island with minimal color and clear text</p> <ul style="list-style-type: none"> ▪ Components that are too small make people feel lazy to try them, replaced components that are more compatible
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MODEL 2

The second model was made on November 18, 2017 to provide a different experience with the improved game system of the first model, so the most accurate error to search is to play it



Figure 2. Model 2 boardgame

<ul style="list-style-type: none"> ▪ The color difference is quite visible ▪ The writing is hard to read ▪ The meaning of Some purpose cards, hard to understand ▪ Destination card is too big 	<ul style="list-style-type: none"> ▪ The volume and dimensions of the object are made more interesting ▪ Components replaced that are larger and more compatible
--	--

MODEL 3

The third model was created on December 26, 2017 to provide modular system model development in product design to support user experience that can be felt by players.



Figure 3. Model 3 boardgame

<ul style="list-style-type: none"> ▪ Only use one color for graphics ▪ It is difficult to enter additional content or writing on the game ▪ The join is not yet clear 	<ul style="list-style-type: none"> ▪ Materials and visuals are replaced with more clear and appealing to children ▪ All components are incorporated into one or all of the same design themes
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Evaluation results from model 1 - 3 was applied to the next game model that is 4-6 model, with the addition of game content.

Table 2. Evaluation Table 2 models on Test Play

MODEL 4

The fourth model was created on February 23, 2017. The fourth model is greatly changed due to the addition of the required content in the game so it becomes a necessity to change many of its game elements.



Figure 4 . Model 4 boardgame

<ul style="list-style-type: none"> ▪ Ergovisual for intellectual turnover and inappropriate experience ▪ The island is difficult to install 	<ul style="list-style-type: none"> ▪ Changes in materials used ▪ Dimensions need to be changed ▪ Graphics and
---	--

<ul style="list-style-type: none"> ▪ Not all table are compatible with such sized hole boards ▪ House walls are difficult to install and put together ▪ Graphics and layouts need to be fixed 	<ul style="list-style-type: none"> layouts need to be fixed ▪ Black staple color changed
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MODEL 5

The fifth model was created on March 15, 2017. This fifth model is a visual change from the fourth model because of the difficulty in understanding the content visually seen. Color also experienced many changes that put forward the fun of children.



Figure 5 . Model 5 boardgame

<ul style="list-style-type: none"> ▪ Ergovisual for intellectual turnover and experience are not inappropriate ▪ The island is difficult to install ▪ Not all are compatible with such sized hole boards ▪ House walls are difficult to install and put together 	<ul style="list-style-type: none"> ▪ Changes in materials used ▪ Dimensions need to be changed ▪ Graphics need to be fixed
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MODEL 6

The Sixth Model is a concept created on May 22, 2017. The sixth model of this manufacturing stop in 3 Dimensional concept and 3D print model, which is due to some of the following



Figure 6 . Model 6 boardgame

<ul style="list-style-type: none"> ▪ Production is quite complicated and requires a lot of material ▪ INT and EXP indicators need to be fixed as they are not appropriate ▪ Some dimensions are too big 	<ul style="list-style-type: none"> ▪ Production is quite complicated and requires a lot of material ▪ INT and EXP indicators need to be fixed as they are not appropriate ▪ Some dimensions are too big
--	--

The Model Study and the 8th game test is the result of an evaluation of model studies and game tests of model 7 and earlier models. In model 7, the design model is emphasized on material selection and production process. From model 7 followed by the process of refining the design on model 8 and the final design on model 9.

Table 3. Evaluation table 3 models on Test Play

MODEL 7	
<p>The seventh model was made on July 14th where the model was adapted to a function similar to the sixth model but suppressed the price of production and materials</p>	
<ul style="list-style-type: none"> ▪ The concept of interchangeability is supported by the unloading of inter- 	<ul style="list-style-type: none"> ▪ Material less luxurious not in accordance with the persona

Figure 7. Model 7 boardgame

<p>island packaging and magnetic packaging and packaging</p> <ul style="list-style-type: none"> Visual improvements take on pastel colors Inexpensive materials ie cardboard and paper 	<ul style="list-style-type: none"> Visual design is less supportive with the image board The shape of the island is ambiguous, a case can be assembled when not
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MODEL 8

This eighth model was made on July 26th where this model was made based on the model 7 fixture and considering the printing factor in model 4.



Figure 8. Creation of 8 board game model

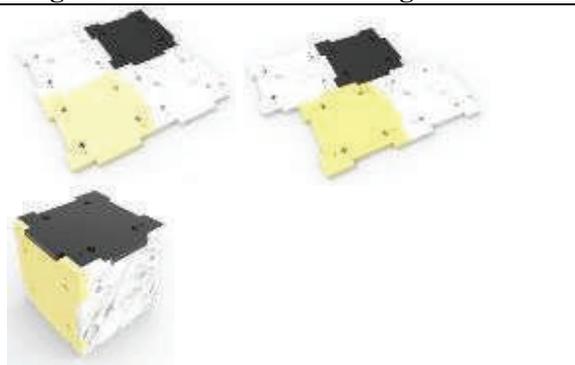


Figure 9. Configuring the 8 board game model

<ul style="list-style-type: none"> The island can be directly assembled without the need for more boards The island can be assembled from many sides but it can not be arranged vertically 	<ul style="list-style-type: none"> Module system needs to be improved in order to be arranged more freely, that can be arranged vertically as well Colors need to be improved to fit the ergonomics of children recognizing
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	symbols
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MODEL 9

This ninth model was created on July 31, 2017. Where this 3D module was made based on model 8 improvements in terms of modules for assembly



Figure 10. Detail of island model 9 board game

Module after repaired and disassembled the upper side of it

Terms of Winning and Losing in the Game

The player will be declared victorious if he has the most coins. So at the end of the game, all will be accumulated with coins. The accumulation is as follows;

Table 4. Table of Accumulated Coins

Point Name	middle of the game	Final point of game
Coint	1 coin	1 coin
Wall	2 coins	4 coins
House	20 coin	30 coins
Intelligence	1/5 coin	1/3 coin
experience	1/5 coin	1/3 coin
Flag	3 coins	4 coins

Game Components

Based on the needs of the game, the required game components are as follows:

Table 5. Model Evaluation Table on Test Play

Picture	information	Amount
	Flag Shows special achievements that can be redeemed for 3 coins	15

	Ship Useful as one means of investment, the advantage is players can take advantage of the island next to it	4
	Island To take advantage of the player's choice	14
	Great Island To calculate the experience and intelligence that players have	1
	Pawn of Experience & Intelligence Shows the intelligence and experience of players	8
	Coin As a medium of exchange in this game	85
	Tree Pointers of the island that will gain intelligence points	12
	Cow The island pointer will gain experience points	12
	Wall Pointers of the island that got Wall	3
	First Player Island pointer that gets first player benefits	1
	Gimmick coins Indicators of the island are benefiting	1

	additional coins	
	Wall Pawns to build a savings house that can be sold at any time	60
	Roof Pawns to provide house cover	4
	Card Event Card to give day privileges	30

Branding Analyst



Figure 11. Kukaya Logo

The title of this game is "Kukaya" which comes from the connection of the word 'Aku' 'Kaya' where the word matches the purpose of this game to grow the habit of the rich. So expect each child to see the code and this word, children are accustomed to think and behave like the habits of the rich.

Final Design

Here is the final design of this design is the Boardgame Design for children about investing early on. This design has a freelance concept with this system game components can be randomized to provide a different playing experience.



Figure 12. Boardgame Final Design

The picture above is a normal configuration of island settings on Board Game.



Figure 13. Other configurations Board Game's final design

The picture above is another configuration of island settings on Board Game.



Figure 14. Exploding View

The picture above is a description to show unloading pairs of games



Figure 15. Island assembling

CONCLUSIONS

The conclusions of the Boardgame design for children on early investment are as follows;

1. The material used for Boardgame should be able to suppress the price of production, because in one boardgame there are many gimmicks in it

2. Persona and positioning and price of mass production is very important in this design so that the product does not exceed the budget and the right target according to price.
3. Boardgame should load a lot of user experience that can support the game so that players can feel the real roleplay.

REFERENCES

- [1] Armstrong, Thomas. 2002. *Setiap Anak Cerdas*. Jakarta: Gramedia
- [2] Chandra, Bong. 2010. *Unlimited Wealth*. Jakarta : Gramedia
- [3] Kiyosaki, Robert. 2000. *Rich Dad, Poor Dad*. Jakarta: Gramedia
- [4] _____. 2003. *Retire Young, Retire Reach*. Jakarta: Gramedia
- [5] Aida Suryani dan Rusdi Noor Rosa. 2014. Using a Board Game “Snake and Ladder” in Teaching Speaking at Junior High School (*Jurnal Bahasan dan Budaya*). Sumatera Barat: Universitas Padang
- [6] Allvanialista Ikalor. 2013. *Pertumbuhan dan Perkembangan Anak* (*Jurnal Pertumbuhan dan Perkembangan*). Dikti Daniel Limantara1. Heru Dwi Waluyanto dan Aznar Zacky. *Perancangan Board Game Untuk Menumbuhkan Nilai-Nilai Moral Pada Remaja* (*Jurnal Sains dan Seni*). Surabaya: Universitas Kristen Petra
- [7] BSN group. 2012. *Standar Kamanan Mainan Anak* (*Jurnal Nasional*). Jakarta: Indonesia
- [8] Napsiah. 2012. *Pengaruh Uang Saku Terhadap Hasil Belajar Siswa Di Sekolah Menengah Pertama Islam Terpadu (Smpit) Assy-Assyukriyah Cipondoh Kota Tangerang (Skripsi)*. Tangerang: Univeristas Islam Syekh Yusuf
- [9] Natya, Lakshita. 2014. *Hubungan Antara Pengetahuan, Pola Konsumsi Jajanan Dan Status Gizi Siswa Sekolah Dasar Di Wilayah Kabupaten Cilacap (Skripsi)*. Yogyakarta: Universitas Negeri Yogyakarta
- [10] Nusantara, Besta dan Irawan, Hamzah. 2012. *Perancangan Boardgame Sebagai Media Pembelajaran Ilmu Pengetahuan Alam untuk Anak SD Kelas* (*Jurnal Sains dan Seni*).

Surabaya: Institut Teknologi Sepuluh Nopember

- [11] Sulaiman, Umar. 2014. Mengidentifikasi Kecerdasan Anak (jurnal Pendidikan). Sorong: Sekolah Tinggi Agama Islam Negeri Sorong
- [12] Tyas, Eunike. 2009. Gambaran Perilaku Jajan Murid Sekolah Dasar di Jakarta (Jurnal Psikologi). Jakarta: Universitas Katolik Atma Jaya
- [13] Yuhendri, Idris dan Yeniwati. 2013. Pengaruh Kualitas Pendidikan, Kesehatan Dan Investasi Terhadap Pertumbuhan Ekonomi Di Sumatera Barat (Jurnal Ekonomi Pembangunan). Sumatera Barat: Universitas Negeri Padang
- [14] Yunita Syafitri, Hidayat Syarief dan Yayuk Farida Baliwati. 2009. Kebiasaan Jajan Siswa Sekolah Dasar, Studi Kasus Di Sdn Lawanggintung 01 Kota Bogor (Jurnal Gizi dan Pangan). Jawa Barat: Institut Pertanian Bogor

Creative Process in Poster Production for Wayang Kulit Show

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Abstract – Gestisutis is one of the creative industries in Indonesia that rarely encountered. The existence of Gestisutis becomes its own appeal for further review, especially regarding its creative work process in producing Wayang Kulit posters. This research aims to reveal the creative process of Gestisutis in producing Wayang Kulit Posters. The method used in this research is descriptive qualitative. Data were obtained through in-depth interviews with key informants Gestisutis, observation, and content analysis. The data obtained were analyzed using interactive analysis technique. The results of this study indicate that first, in the arts group requires good management in the process of creative work. Secondly, through its creative work Gestisutis can contribute in the development of national economy.

Keyword – creative work, design management, poster art.

1. INTRODUCTION

GestiSutis is a group that focuses on producing poster artwork. Its existence can be found around the ongoing *wayang kulit* show, especially in Surakarta city, Central Java. Posters produced by Gestisutis are rich in aesthetic and artistic touches, and are identical with the presence of visual elements of *wayang*.

Leather puppet (*wayang kulit*) is not only a traditional arts heritage that can be as a way of human life, but also using it as a way to communicating and connecting to their God. (Sukirno, 2009:24).

The existence of Gestisutis is an attraction for further review, especially regarding the creative work process of producing posters, and then exhibiting the posters, or even selling the posters to the public. Therefore, in this study using the point of view of design management.

Management is a work process that includes the functions: (1) planning, is steps that must be prepared; (2) organizing, positioning duties and

responsibilities to members; (3) actuating, activities or actions undertaken to enable the activity to proceed regularly; And (4) controlling, is checking for the success of the established plan (George R Terry in Sutiyono, 2010: 251).

Byrnes has a different view that an arts group has management functions including planning, organizing, leading, and controlling (Byrnes, 2009: 16). Leading in Byrnes's theory is deciding someone to be able to help complete the planned program (Byrnes, 2009: 17).

To reveal the visual style of the poster design by Gestisutis, this research uses Meggs style design thinking. In Meggs thinking, in the history of design there are various styles of design with certain characteristics, which can be a marker of an era or era. For example is the style of Arts and Crafts with its shape that decorative qualities prioritizes and comes as a response to the Victorian style (Meggs, 2012: 176-179, 195). Or like Art Nouveau style with the characteristics of organic quality, line like plants, wavy, energetic, elegant, tendrils, and usually adapt the female figure (Meggs, 2012: 200-201, 214).

2. METHOD AND ANALYSIS

In order to obtain the results of this research, this research uses descriptive qualitative approach, which describes in detail and depth about the actual conditions that occur according to what is in the field (Sutopo, 2002: 111).

Sampling method used in this research is purposive sampling. Sutopo (2002: 36) asserts that purposive sampling is more appropriate for qualitative research because it captures the completeness, correctness, and depth of data.

Data obtained through: 1) In-depth interviews with key informants, ie GestiSutis actors; 2) Observation play an active role, that is participate during the creative work process GestiSutis (Sutopo, 2002: 67-68); And 3) Content analysis, which records important contents (either expressed or written) on documents or archives of photos, pictures, videos, important notes, and other documents (Sutopo, 2002: 69-70).

This research uses triangulation of data source, that is using various data source different (Sutopo, 2002: 81). Sources of data in this study, among others: documents (pictures, photos, video), archives, key informants, recording, and events. The analysis used is interactive in the form of component of analysis: data reduction, data presentation, conclusion and verification. The three components will be involved in the analysis process, also interrelated and determine the results of the analysis (Sutopo, 2002: 91).

3. RESULT AND DISSCUSION

GestiSutis is an art group founded in Solo on September 8, 2011. The founders and members of this group are Randy Eko Prasetyo (30th) and Eka Rahmawan (30th). Both are Bachelor of Visual Communication Design from UNS, Surakarta. GestiSutis has created 37 pieces poster themed Wayang Kulit Performances. The existence of this group can usually be found around the Wayang Kulit show that are being staged in the area of Surakarta City. Posters showcased using paper media with A2 size, and display a staged theme or play theme picture (see Figure 1).



Figure 1. Examples of Wayang Kulit posters Show that GestiSutis had produced. (Photo source: GestiSutis, 2012).

During this time, GestiSutis has moved the studio up to three times. In 2011, GestiSutis has a studio located in Kampung Sambi, Kentingan Wetan, Jebres, Surakarta Indonesia (east of Mangunjayan Hospital, Surakarta). Then at the end of 2012, GestiSutis moved the studio in Rusunawa Jurug, 4th floor No. 3, Kentingan Wetan, Jebres, Surakarta. Furthermore, in 2013, GestiSutis moved the studio on Jl. Gotong Royong, RT 04 / RW IV, Jagalan, Jebres, Surakarta. In this latest studio GestiSutis has been working with other communities, Tugitu Unite, Srawung Photo Forum, Kereta Express, and several other artists. GestiSutis Studio refers to an alternative space for managing arts activities. Alternative spaces tend to be participatory, ideologically independent, and a form of resistance from established systems (Agung Kurniawan in Yoshi, 2012: 62).

GestiSutis was founded not aimlessly. According to Randy and Eka, GestiSutis internal goals were established to meet the needs of aesthetic expression, and able to live GestiSutis own studio from the sale of posters. In addition, for external purposes they also hope the poster work can become a medium of cultural information of sustainable traditions and educational media to the public (in-depth interview with GestiSutis, December 2014, Solo).

GestiSutis has a long journey and structured in the creative work of creating poster (see Table 1). There are three stages to go through: Pre-production, Production, and Post-production.

In this research, Pre-production stage is a planning stage. The pre-production stage is the stage when

GestiSutis search the source of information performances, brainstorming, planning and visual design in the form of sketches, digital sketches, to preview. When brainstorming, GestiSutis sometimes involves a *dalang* (master of puppet show). This is an advantage for GestiSutis, which facilitates the exploration of ideas and concepts, as well as GestiSutis's increasing insight into the world of *wayang*.

GestiSutis starts visual planning and design through sketches, digital, and preview. In this process, GestiSutis always uses certain design styles, such as Art Nouveau, Arts and Crafts, Comic, Victorian, Realist, Psychedelic, and others. The design style on the poster is the translation of GestiSutis's creative perception and imagination of the puppet play (Wrathall in Parry, 2011: 12; Merleau-Ponty 1993: 126). In the organizing of creative work, GestiSutis always works collectively; work together, help each other, and complement each other or complement the ability.

Table 1. Structure creative work making posters from GestiSutis.

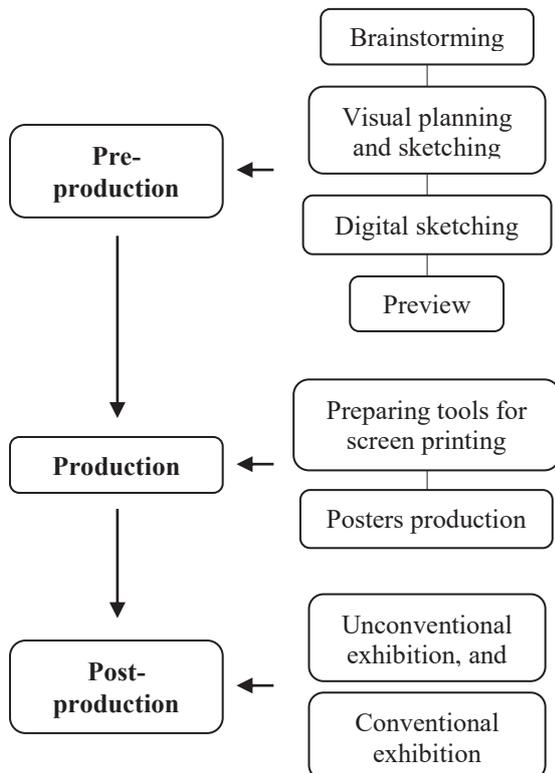


Figure 2. Eka is working on a digital sketching stage at GestiSutis studio. (Photo source: Nababan, 2014).

At the production stage, GestiSutis prepares the equipment and media used to produce posters. Posters are produced with conventional printmaking techniques in the form of screen printing techniques (see Figure 3), which is a screen printing technique with the creation media in the form of silkscreen (Dharsono, 2004: 37-38). Equipment and media required: silkscreen, squeegee of screen printing, poster paper, ink oil, glass table, M3 fluid (for mixing ink), duct tape, and lamps. Poster works tend to print as many as 20 editions of each poster. This is another feature of conventional graphic art, which is printed beredisi, the limited number adjusted to the artistic achievements desired artist (interview Rahman, December 24, 2014, in Solo). All printed posters have GestiSutis identities using stamps, and edition numbering.

The production stage is an actuating process, and followed by post productions stage.



Figure 3. Randy when printing posters with silkscreen techniques. (Photo source: GestiSutis, 2011).

In the post-production stage, GestiSutis showed his poster works at a *Wayang Kulit* show that was his target. Usually around the city of Surakarta, such as in Central Java Cultural Park Surakarta, or in RRI Surakarta. However, GestiSutis also showcased his poster works in an art exhibition. In this study, distinguished exhibition followed by GestiSutis, namely (1) Non-Conventional Exhibition, is a GestiSutis way of showing the work to the public in a wayang kulit show. GestiSutis called it by the term street exhibition, the exhibition by bringing the poster art works to the public by coming directly to a *Wayang Kulit* show. Through the street exhibition, precisely GestiSutis get a lot of real experience, in the form of different appreciation from the public. Differences in the form of appreciation is due to educational, social and cultural background, and age. Appreciation form, among other suggestions and criticism, also appreciate by buying the work of GestiSutis poster (see Figure 4). GestiSutis poster works is sold for Rp 25.000, - to Rp 50.000, - depending on the difficulty level of poster production and the amount of ink used. Overall profit is used to replace the production cost of posters and studio operations.



Figure 4. A *Wayang Kulit* Show visitor took the time to come and appreciate, even buy the poster work of GestiSutis. (Photo source: GestiSutis, 2011).

In relation to the sale of posters, the poster of GestiSutis works as artist merchandise, an art product produced by GestiSutis through art exhibitions and direct sales to the public (Murti, 2012: 124-125)

Furthermore, (2) Conventional Exhibition, is a way GestiSutis showcased his work to the public in a gallery at a particular exhibition event. In this sense, GestiSutis contributes as one of the invited artists.

Art exhibitions that GestiSutis has participated in include: (a) The exhibition titled "Studio: Tugitu Unite X Milisi Photocopy", in Princess Artsapce Month, Jl. Flowering Hills. 10, Sidomulyo, Stone; And also (b) "Festival Wayang Sehari", a series of events from "Road to Bandung Wayang Festival", on 23 November 2013, in Braga City Walk, Bandung. (c) Exhibition "Pekan Seni Grafis Yogyakarta", on 18-31 July 2017, at Jogja National Museum, Yogyakarta.



Figure 5. GestiSutis became one of the group of invited artists at the Festival Wayang Sehari, a series of events Road to Bandung Wayang Festival, November 23, 2012, Braga City Walk, Bandung. (Photo source: GestiSutis, 2013).

appreciation of a teacher who was surprised and wondered to know the existence of GestiSutis, as a representative of Solo. These scholars think that Solo wayang kulit performances are extinct. GestiSutis then gave a lot of information that the wayang kulit performance in Solo is still very fertile. In this case, indirectly GestiSutis has been involved in promoting the traditional art of wayang kulit performances that are still often performed in Solo.

After performing the exhibition process, both conventional and non-conventional, GestiSutis conducted a review or review of the achievements that have been made. This is to know the shortcomings during the creative work process, to then as a learning in the next creative work process. In Byrnes's thought is referred to as controlling or checking (Byrnes, 2009: 18). Furthermore, GestiSutis did the archiving of the poster works he had created in the studio.

It should be noted that, not every theme in a wayang kulit show is the target of GestiSutis creative work. This is because sometimes GestiSutis does not have

sufficient budget to produce posters. In fact, from the recognition of Randy and Eka, they also often use their personal money to do creative work at GestiSutis. This is where the shortcomings of GestiSutis, the need for a leading role to seek assistance in the form of sponsorship fees, both from private and government, for GestiSutis studio can still operate doing creative work of producing poster work. In another sense, GestiSutis really needs a manager who can manage GestiSutis studio operations or management.

In addition, GestiSutis also acknowledged the need for the role of government to pay more attention to the actors of design art. GestiSutis hopes the government can provide education or direction about fundraising for capital assistance managing the studio. Where possible, at least the government can help facilitate access to seek government assistance. With the source of initial capital, of course GestiSutis no longer confusion or even absent in producing works of posters. In addition, GestiSutis can also develop its creative potential. Moreover, in the Creative Economy Agency, GestiSutis belongs to the category of visual art sub-sector, or visual communication design that has the potential to be further developed. So as to contribute to the development of national economy.

4. CONCLUSION

The sustainability and resilience of an art group, correlated with well-managed management. With a structured management pattern, then make the art group can continue to perform creative work processes to produce works of art.

GestiSutis is already good enough in building and managing alternative studios. And creative work that has been done in producing poster work through highly structured stages. The group is also able to survive until now (6 years, 2011-2017) produces poster artwork and exhibits both conventionally and non-conventionally.

This management will become better when there is a strong presence and responsibility and discipline of a leader. In any other sense, any form of art group, whether large or small, will require managers to manage the group, and demand the commitment and responsibility of core members, so that GestiSutis can always produce qualified, showy, and Worthy to be sold just like artist merchandise.

On the other side, is also important for the role of government to provide easy access or capital assistance for the development of art bags such as GestiSutis. Through capital assistance, art groups can withstand the creative work of producing quality artwork, and even develop their creative potential. Thus, the pockets of art can contribute creatively to the development of the national economy.

5. REFERENCE

- Byrnes, William J. (2009). *Management and the Arts* (4th ed.). USA: Elsevier Inc.
- Kartika, Sony Dharsono (2004). *Seni Rupa Modern* (1st ed.). Bandung: Rekaya Sains.
- Merleau-Ponty, Maurice (1993). *Eye and Mind*. In Galen A. Johnson (Eds.), *The Merleau-Ponty Aesthetics Reader: Philosophy and Painting* (Michael B. Smith, Trans.) (pp. 121-149). Evanston, Illinois: Northwestern University Press.
- Megg's, Philip B., Alston W. Purvis (2012). *Megg's History of Graphic Design*. Hoboken, New Jersey: John Wiley & Sons, Inc
- Murti, Yoshi Fajar Kresno (2013). *Kolektif Kreatif: Dinamika Seni Rupa dalam Perkembangan Kerja Bersama Gagasan dan Ekonomi (Kreatif) (1938-2011)* (1st ed.). Yogyakarta: Indonesia Visual Art Archive (IVAA).
- Sukirno, (Juli 2009). *Hubungan Wayang Kulit dan Kehidupan Sosial Masyarakat Jawa. Brikolase, 1*(1), 16-32.
- Sutiyono, (Agustus, 2010). Manajemen Seni Istana Kasultanan Yogyakarta sebagai Penangkal Krisis Pariwisata Budaya. *Jurnal Bahasa dan Seni, 38* (2), 242-252.
- Sutopo, H. B. (2002). *Metodologi Penelitian Kualitatif* (1st ed.). Surakarta: Sebelas Maret University Press.
- Wrathall, Mark (2011). *The Phenomenological Relevance of Art*. In Joseph D. Parry (Eds.), *Art and Phenomenology* (pp. 9-30). London: Taylor & Francis.

6. INTERVIEW

Prasetyo, Randy Eko (30), creator and co-founder of GestiSutis. Sragen.

Rahman, Deni (39), printmaking artist from Grafis Minggiran Studio. Yogyakarta.

Rahmawan, Eka (30), creator and founder of GestiSutis. Boyolali.

The Exploration of Sasak Cultural Heritage into Interior Hotel Design

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Abstract — Lombok is one of the most exquisite island with tropical lifestyle and also cultural richness from it's local tribes. Located in Indonesia, Lombok Island has strong and unique tribe called Sasak. It has many beauty cultural heritage which attracts lots of tourists such as tenun fabric, traditional lumbung padi building, and many more. Along with the increasing amount of tourists visit in Lombok Island, hotel accomodation demand is getting higher. The more hotels build means the competition among hotels to attract tourist is higher. One of the primary determinant factor is the interior design. Because interior determine comfort and beauty inside a building into a good harmony combination for visitor to enjoy. As Sasak tribe has strong and unique cultural heritage such as Lumbung Padi building and tenun fabric to attract tourists, it is a bright idea to make a design concept of it to be applicate in interior design of a hotel. Aside of the increasing hotel visitors, the design concept automatically introduce Lombok cultural heritage to worldwide tourists.

Keywords – *Lombok Island, Sasak Tribe, Interior Design Hotel.*

1. INTRODUCTION

Tourism sector in Indonesia is getting greater nowadays. Lombok Island is one of the most visited island after Bali. Based on tourism government's social media in *instagram* on April 11th, 2017 they launched an international air route from Korea to Lombok with JinAir company. And also in the end of 2016, PT Ferry Indonesia had launched they new sea route from Surabaya to Lombok. By the increasing number of transportation route to Lombok Island, there are chance for greater amount of visitors and higher demand of hotels.

Lombok island is famous with its tropical lifestyle. The hotels are commonly have the same surrounding such as beach and hills. Aside of the beautiful scenery that Lombok Island have, the cultural heritage from it's local tribe, called Sasak, is one of the most exclusive thing to learn for tourist while in Lombok Island. To promote the cultural heritage effectively, it could be implemented

in interior hotel design concept which is commonly chosen by tourist worldwide.

2. METHODS

The first method in designing interior Lombok hotel is determine the concept design. Tenun fabric and lumbung padi building are two among plenty cultural herritages of Sasak tribe which is strong and unique cultural heritage to be applicated in the hotel design concept. After choosing the chosen cultural heritage, specify the location of the suitable existing hotel.



Figure 1. The Lumbung Cottages hotel (Source : Anggrita, 2015)

The criteria of the object are located near tourism spot, have a nearly good facility, and applicable for implementing the concept design. The selected object is Lumbung Cottages Hotel, located in a micro island called Gili Trawangan. After choosing the hotel, survey the existing location, observe as a guest hotel, interview the hotel manager, and also literature studies are needed to support the research.

3. DISCUSSION

Gili Trawangan is a micro island located in west Lombok, which is tourist most favorite place to go because of the eco-environmental lifestyle. Cidomo and bicycle are the only vehicle in Gili Trawangan, cars and motorcycles are prohibited by the locals for efficiency (Supriyantho Khafid, submitted for published in 2012). Based from data interview with hotel manager, the visitor mostly form backpackers. There are plenty hotels in Gili Trawangan, one of them is Lumbung Cottages which is suitable with the research cases such as designing an effective siteplan hotel and applicable for implementing the concept design.

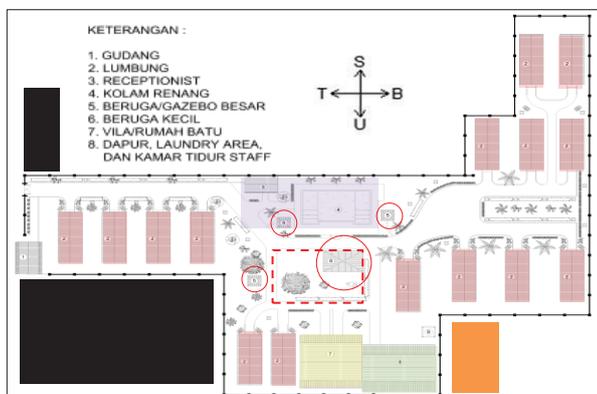


Figure 2. Siteplan eksisting hotel (Source : Anggrita, 2017)

Based from figure 2, the hotel is located at a corner of a crossroad, next to a Japanese hotel (orange square) and local people houses (black squares). The hotel entrance is located at the east side (T) and the main street is at the north (U). Based from the survey and interview data, the research object is an independent hotel. It has 15 cottages (red squares), 2 vila rooms (yellow square), service area (green square), receptionist and swimming pool (purple square).

It also has cozy atmosphere with plenty of trees and greeneries, with 4 open cottages called beruga (red circle). But those 4 berugas are quite inefficient, because only fits for up to 4 groups of visitors. To maximize the function and consumer of beruga, plan to build a lounge in the centre of the hotel (red strips line on figure 2) are quite efficient because it fits more than 4 groups with a touch of natural atmosphere.

3.1 LOUNGE LAYOUT CONCEPT

The lounge hotel is a semi outdoor building, inspired by Lumbung Padi traditional building of Sasak tribe. Based from the data interview with the hotel manager in Gili Trawangan, the visitors in the hotel are mainly family and couple. From the visitor category, the hotel needs more bigger gathering space than 4 berugas. The main goal to build lounge is to give visitors a bigger space than beruga to gather with another visitor with a view of pool and wifi connection.



Figure 3. Lounge Layout Design (Source : Indonesian Heritage Architecture, 2002)

Prof. Dr. Haryati Soebadyo and team (2002) in their Indonesian Heritage: Architecture books points out, “Lumbung Padi is a signature architecture from Sasak tribe. The building itself have 2 floor levels with approximately 5 meters height. The upper floor is a closed room with one tiny door to store the rice and prevent hama. And the first floor is an open space with wooden columns for sheltering people to do activity” (p.40). Based on field observing at Sade Village Lombok, the people usually do activity such as weaving tenun fabric in the first floor of Lumbung Padi building.

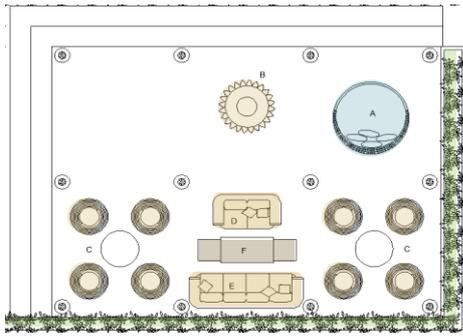


Figure 4. Lounge Layout Design (Source : Anggrita, 2017)

The lounge design concept is inspired from Lumbung Padi building. It has about 6 meters height from top to ground level. The difference from conventional Lumbung Padi building is from floor level. The ceiling is exposed at the bottom side for interior aesthetic and also the lounge activity is centered at 8x11m² floor and 66 cm above the ground level. Those are capable for relaxing area with a view of swimming pool and a touch of greeneries surroundings.

3.2 LOUNGE CEILING CONCEPT

There are plenty cultural heritage by Sasak tribe, but the lumbung padi roof style have a special place in tourists heart to feel living like locals. In existing hotel location, the room cottages building style are pure from traditional lumbung padi design. To reduce the extremely hot weather in an island, the traditional and natural concept with a bit touch of modernism is a perfect combination of interior concept design for semi-outdoor area.



Figure 5. Transformation design of lumbung padi (Source : travelkompas.com & Anggrita, 2017)

The ceiling is emade from combination among dried brownny blady grass, wood, WPC (wood plastic composite), and concrete. It has an exposed concept at the bottom side for interior aesthetic, with a

touch of traditional chandelier combined with wooden ceiling fan.

3.3 FLOORING CONCEPT

The flooring concept are using natural concept. Presented in a touch of wood color, blend perfectly with the colors of greeneries, stone, and anything surrounds the lounge area. The flooring material is using Wood Plastic Composite (WPC) with wood pattern of teak, to give the visualization of natural atmosphere. WPC material for lounge deck is good for semi outdoor and humid area rather than traditional wood board. It is more eco-friendly and easy to maintain than using traditional wood decking. Here is a picture of the example of WPC deck product by DUMA Decking :



Figure 6. Wood Plastic Composite DUMA Decking in 3 varian colors: Ebony, Oak, & Teak. (Source : DUMA brochure, 2017)

3.4 WALL CONCEPT

The wall concept at lounge area is inspired from the local Sasak tribe habit which is doing activities under the lumbung padi room among columns.



Figure 7. (from left) the greeneries type and wall design implementation (Source : pinterest.com & Anggrita, 2017)

The area itself has a semi outdoor design with half wall concept. The walls are made from concrete with 1,5 meters height from ground level. The concrete are a form of greeneries pot. The greeneries are using wide leaves type such as bird of paradise leaf (see figure 7).



Figure 8. Lounge interior (Source : Anggrita, 2017)

Inside the lounge area, there are full of chairs and sofa for visitors to relax and enjoy the beverages with a view surroundings the lounge hotel (see figure 9). The beverages are served by the bar hotel, located outside the lounge.



Figure 9. The view surrounding lounge hotel (Source : Anggrita, 2017)

3.5 FURNITURE CONCEPT

The furniture concept is inspired by local tenun lurik fabric, combined with the shape of Lumbung Padi roof style. Tenun lurik fabric is dominant with it's colorful lines. It's commonly used for fabric combination in Sasak tribe traditional clothes (see figure 10).



Figure 10. The view surrounding lounge hotel (Source : google.com, retrieved August 2017)

Tenun fabric also has special character such as pop bright color with arrangement of line shape. It is beautifully applicated in the backrest of the single seater, combined with transformation design from Lumbung Padi roof front shape. The materials are made from combination between rattan and colored rope. The colors of the rope at the backseat are yellow, tosca, and grey. The three of them are the definition of beauty combination between sunlight and sea, with an inspiration from tenun lurik fabric style pop colors.



Figure 11. Furniture transformation design (Source : Anggrita, 2017 & google.com, retrieved 2017)

4. CONCLUSION

The research conclusion about exploration Sasak tribe's cultural heritage into interior design concept is the correlation between the design result and design method are connect with harmony to each other. So the Lombok Island will be known not only as a typical tropical land, but also as a land with cultural richness. The selected cultural heritage of Sasak tribe are Lumbung Padi building and Tenun lurick fabric, which already have famous but rarely applicated for interior concept. The two of them are combined with a touch of traditional, natural, and modern concept interior design to be applicated as furniture, wall, and ceiling in a lounge hotel at Gili Trawangan Island.

ACKNOWLEDGEMENT

Special thanks to Lumbung Cottages hotel and Institut Teknologi Sepuluh Nopember who support the writer through making the journal.

REFERENCES

- [1] Arismundar, Agoes, dkk. 2002. Indonesian Herritage Arsitektur. Jakarta: Jaya Agung
- [2] Khafid, Supriyanto. (2015, May 05). Mengapa Gili Trawangan Tanpa Kendaraan Bermotor. *Tempo*. Retrieved August 13, 2017, from <https://travel.tempo.co/read/news/2012/05/05/204401808/mengapa-gili-trawangan-tanpa-kendaraan-bermotor>

Study of Batik Motif From Molecular Inspiration To Enrich the Composition of Nusantara Batik Motif

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Abstract — Batik as one of Indonesia's cultural is an icon of national identity that is very close to the community because it can be reached by any people. The beauty of batik lies in a combination of motifs and colors are applied, its a meaning about the uniqueness of the origin from manufacture of batik. The development of batik motif increase every years. Batik artists are expected to make new breakthroughs in batik design. Therefore, it is necessary to innovate the design of batik motifs. The pattern of the formation from leaf stomata molecules processed into a unique batik motif and has a high artistic value. There are three phases of design that must do, observation of leaf molecules, sketching the formation of leaf molecules, making the composition of batik motif from the existing molecular formation then go into the process of batik. By observing the principles in batik 'isen-isen' and 'nglatari'. So the result of the composition batik molecular motifs can be balanced between large and small size. Batik motif of this molecular inspiration has a uniqueness in terms of the process of creating a form, setting the composition between the stomata and color formations. Formation of this batik motif also looks neutral so it can be used in anything without reducing the meaning of the batik motif itself.

Keywords – *Motif Batik, Molecule, Stomata, Leaf, Indonesia, Unique.*

1. INTRODUCTION

Batik is a cloth with motifs drawn using wax material and processed through a distinctive technique. The materials and manufacturing techniques used to give a great influence on batik produced. The idea of the story in the process of making batik motif is also one of factor the beauty of batik. On 2 October 2009, UNESCO officially admitted Indonesian Batik into the

Representative List as a Non-Heritage Culture of Humanity in the 4th Session of the Intergovernmental Committee on the Heritage of Takafat in Abu Dhabi. UNESCO acknowledges that Batik Indonesia has the techniques and cultural symbols that became the identity of the Indonesian people from birth to death, when baby on newborn phase is picked up with batik and when someone dies then the batik is used too as a cover. Batik as one of Indonesia's cultural richness is an icon of

national identity that is very close to the community because it can be reached by any circle. In addition, batik can also be applied in any form so that local and international communities can enjoy this unique Indonesian art and culture easily.

The beauty of batik lies in a combination of motifs and colors are applied so that it displays a meaning about the uniqueness of the origin of the manufacture of batik. Each region in Indonesia has a variety of typical batik motifs and every scratch motifs there is a very beautiful meaning. The more unique motifs and colors are made had impact to the selling price of batik products will be more expensive.

The development of batik motif every year increase at many varieties. Batik artists are expected to continue to make new breakthroughs in batik design. Therefore, it is necessary to innovate the design of batik motifs to increasing the richness of batik motifs composition. As a student on campus based on science, technology and art, this experiment tries to find a new design motif of batik inspired by stomata leaves. Through the pattern of the formation of leaf stomata molecule is processed into a unique batik motif and has a high artistic value. To find the composition of batik motif from the formation of leaf stomata molecules there are several problems encountered, there are:

1. How leaf type and molecular form can be used as inspiration of batik motif?
2. How to design the composition of batik motif from leaf stomata molecule formation?

Batik motif of leaf stomata cell formation requires several special phase in process design. This is because in the process involves microscope technology. The goal to be achieved in the study of batik motifs from molecular inspiration are:

1. Discover the unique characteristics of batik motifs of leaf stomata cells.
2. Discover the composition of batik motifs of leaf stomata molecules.

The composition of new batik motifs is expected in addition to adding a wealth of batik Nusantara and also can be an example of inspiration batik to obtained on anything as long as we are able to design it into a typical batik motif design.

2. METHODS

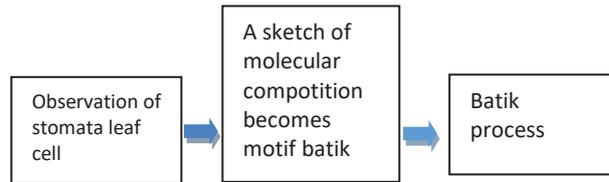


Chart 1. Design Process Chart

Source: Sagaria, 2017.

A. Observation and Sketching Phase

Batik art is one of the cultural products known since the ancestors. Batik is greatly admired not only for its intricate process but also in its unique and beautiful motifs and colors, which are full of symbolic meanings (Indarmaji, 1983: 123). Traditional batik motifs are mostly monumental from nature and its surroundings. It is an imagination of the faith and belief of the artist who is usually anonymous (Indarmaji, 1983: 12). In this observation phase observed the photographs of leaf stomata molecules from the microscopic process.

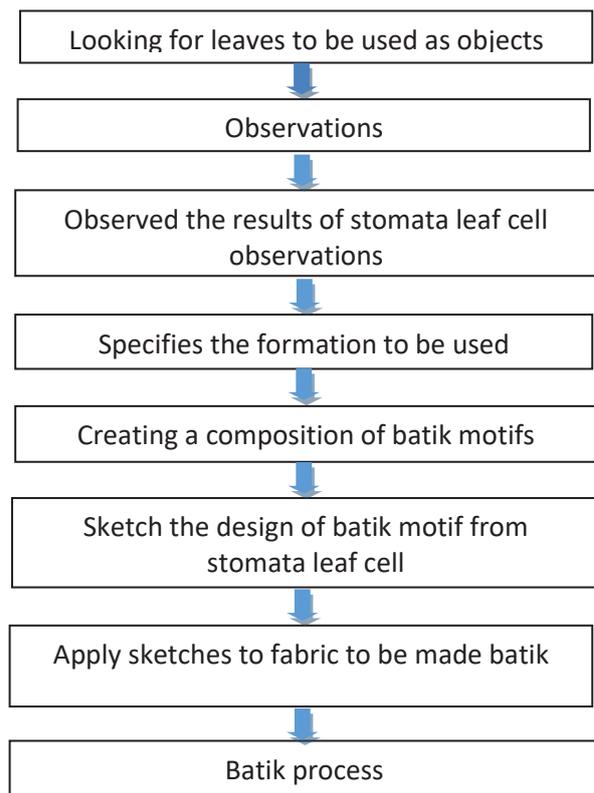


Chart 2. Design Stage Flow Scheme

Source: Sagaria, 2017.

The first process is to find a leaf that will be the object of stomata cell observation. After finding the

leaves then the leaves are taken to the biology laboratory to observe the leaf stomata cells through a microscope. After getting a good photo then started the sketch process.

The first thing to do in the sketching process is to determine which formations will be used as the basis for determining the batik motif. It can be from the formation of transformation and the original formation of stomatal cells. After determining the form to be used continued by combining the formations to form a batik motif. After finished forming batik motif directly to the process of batik by redrawing the batik motif on a special cloth for batik process.

B. Phase of Batik Process



Figure 1. Batik Process Tool and Material

Source: google.com, 2017

Batik process consists of several kinds of techniques, depending on the type of batik and how to stain. For the process of batik motive molekuler stomata leaves this experiment apply the technique of batik colet.

The process of batik with the technique of colet:

1. Draw sketch pattern on primsimma / mori fabric
2. Scratch the canting filled with candles following the pattern of the motif until the entire motif covered with wax.
3. Take the color with a brush, then brush the brush into a field that is still white or not covered with wax.
4. Do it like you're painting a fabric until the whole white cloth is covered in color.
5. After that dry the cloth to dry.
6. Then the 'larod' with boiling water until the wax on the clean cloth is not left.
7. Batik cloth ready for drying.

3. DISCUSSION

A. Phase Looking for Leaf Type

Leaves used as objects vary. This is to find several kinds of formations so that the formation of leaf motifs had many variety. There is no specific criteria in the selection of leaves, it's just seen based on the meaning of the leaves of the plant itself. For example, this experiment uses red shoots plant as an object because red shoots plant have an inverted life when the leaves are young the colour is red but when the leaves are old it just changes color to green. In addition, red shoots plant are also commonly found as a guardrail because the shape is not too large or small and the color is greenish red looks striking.



Figure 2. Leaves of Red Shoots

Source: Sagaria, 2017.

B. Phase of Molecular Observation in Microscope

After getting the leaf to be used, go to the process of taking photos of stomata leaf cells using a microscope. Here is the microscope observation phase:

1. Cover the inner leaves with clear nail polish.
2. Put a clear sole on a leaf that has been coated with nail polish.
3. Take the solation from the top of the leaf, then there is a part of the leaf that attaches to the clear solation.
4. Put a clear sole on microscope.
5. Observe the preparations in the microscope by adjusting the magnification until the stomatal cell shape is clearly visible.
6. Photos of the results that appear and save the file.

The next step is to observe the leaf stomata and sort the formation that will be used as batik motif.



Figure 3. Leaves of Red Shoots Stomata.

Source: Sagaria, 2017.

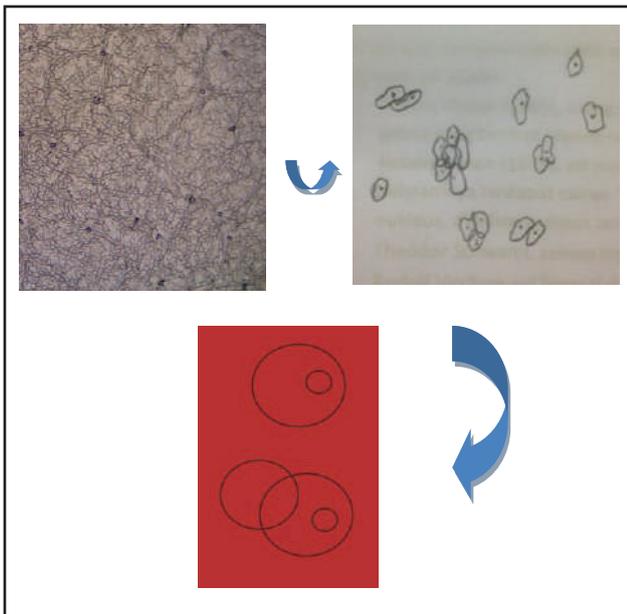


Figure 4. Image of Transformation Process Form Stomata Leaves Red Shoots Source: Sagaria, 2017.

After sorting the image clearly in visible line, then made sketches for early formation. Leaf shoots plant molecules have a small shape because it has a little stomata that influence from leaf color. Stomata will be easy to see if the leaf had a green colour. In the image of the observation, the formation is taken only one formation of spheres that accumulate like eyeballs.

A. Process of Molecular Form Composition

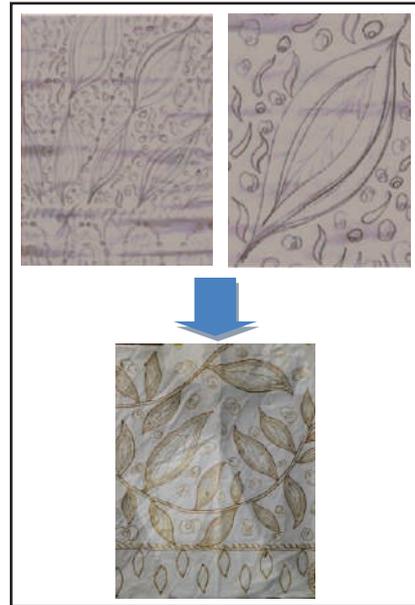


Figure 5. Drawing Process Composition of Stomata Shapes and Red Shoot Leaves

Source: Sagaria, 2017.

The composition of batik motif made based on the formation of the transformation with the shape of red shoots plant. By observing the principles in batik is 'isen-isen' and 'nglatari'. Isen - isen is to provide ornaments as a great filler motif. While nglatari is to provide additional ornaments outside the principal motif. So the result of the composition of leaf batik molecular motifs can be balanced between large and small size.

A. Final Design of Batik Motif

The final design of motif batik size 100 x 200 cm by applying the formation of stomata molecular transformation and the shape of red shoots plant.

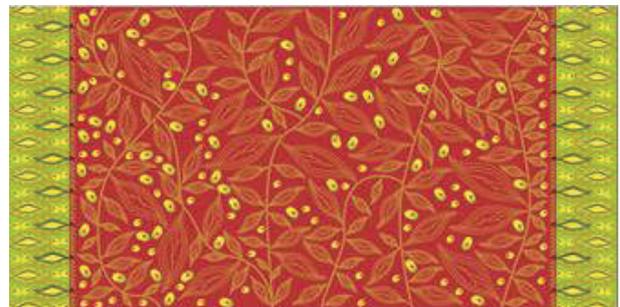


Figure 6. Final Design of Stomata Batik Motif Leaves Red Shoots

Source: Sagaria, 2017.

Selection of red, green and yellow colors to represent the original colors of red shoots plant. The beauty of stomata batik is seen from the combination of shapes and colors used. Combination of stomata formation and leaf form each other to look harmonious. The bright red, yellow and green colors make the batik motif bring a cheerful impression. In addition, the use of red also adds confidence to everyone who uses it.



Figure 7. Example of the Application of Batik Stomata Motif Leaf Red Shoot On Pillow Cushion

Source: Sagaria, 2017.

4. CONCLUSION

Batik motif of this molecular inspiration has a uniqueness in terms of the process of creating a form, setting the composition between the stomata and color formations. Formation of this batik motif also looks neutral so it can be used in any case without reducing the element of meaning of the batik motif itself.

To make a better batik motif depending on the selection of leaf types to be observed, you should choose the type of leaf that is dark green and has no thorns in the plant because both of these things can affect the quality of photos that appear when in microscope. If the image quality is good and clear it will be easier in making the design of molecular formation. When it has determined the formation of molecules applied then the formation of batik composition will be easier and better results.

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REFERENCES

Indarmaji, 1983, Art of Batik Crafts, Tourism Department of Yogyakarta Special Region

Batik Indonesia. (N.d). Retrieved August 12, 2017, from <http://www.antaraneews.com/berita/156389/batik-indonesia-resmi-diakui-unesco>.

Batik Indonesia. (N.d). Retrieved August 12, 2017, from <https://ich.unesco.org/en/RL/indonesian-batik-00170>.

Batik (n.d). Retrieved August 12, 2017, from <http://batik-komar.com/about-batik/kamus-and-istilah-2/>

Designing Visual Book Exploration of Batik Jombang Motifs

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Abstract- The lack of ‘Jombang motifs’ and experts in the field of batik became the main problems in development of Jombang batik. Nowadays, there are only two unique motifs of Jombang batik products. Generally, Jombang batik tends to be made with a stereotype motif according to market preferences and it makes difficult to identify Jombang city by its batik motifs. This study examines the exploration of batik motifs adapted from various potentials of the Jombang city. Researchers use observational and research methods of depth interviews to obtain primary data as well as experimental research, literature studies and existing studies to obtain secondary data as the basis for conducting design. With the concept of "Jelajah Pesona Batik Jombang" this design explores the range of potential areas that could formulate into batik motifs.

The final design is a visual book contains a brief knowledge of Jombang batik as well as the results of the exploration of the new Jombang motifs. This book is also enhanced with visual elements as the main ornaments, additions, and ‘isen’ combined to produce a variety of unique motifs Jombang for the inspiration of batik craftsmen in creating new distinctive motifs.

Keywords –*Jombang, motif exploration, visual book*

1. INTRODUCTION

A. Background

Most areas of Java have their own batik patterns and characteristics. East Java is an area in Java Island with exceptional batik potential, as many as 38 districts competing to pour the characteristics of the region in the motif batik Jombang Regency is no exception.

Batik Jombang has already existed since 1944, but in its journey during the Dutch colonial period, Batik Jombang gradually lost its prestige. Difficulty in getting raw materials and drastic reduction in the number of craftsmen making batik prices become very expensive so less desirable and eventually disappeared. In 2000, batik in Jombang began re-activated through the government program to establish the identity of

Jombang Regency through a typical batik motif Jombang. Jombang Regency Government cooperate with some residents of Jombang who have an interest in preserving batik Jombang to finally created a distinctive motif that is named Jombang batik motif. Since its inception in the year 2000 until now there are two new batik motifs, Ngrimbi Temple and Tower Ringin Contong, this development is considered very slow when compared with other areas that can produce more diverse motifs of batik in a shorter period of time. Some of the things behind the emergence of this problem is the lack of craftsmen and identity Jombang regency. In addition, this situation affects the level of sales of batik with Jombang Motif.

This visual book about Batik Jombang discuss about Jombang Regency, Batik Jombang and pre-existing motifs, and new Jombang motifs exploration. Furthermore, this book can be used as a means of education for batik craftsmen in Jombang regency so that later can create and create motifs Jombang more diverse. With this research is also expected to help increase sales of batik in Jombang regency and make batik Jombang increasingly widely known.

B. Problem Identification

The formulation of the compiled problem is as follows: "How to design a visual book batik typical Jombang formulated from the variety of potential areas of Jombang regency?"

2. LITERATURE REVIEW

A. Batik theory

This theory covers the history of batik in Indonesia, the types of batik, the design component in batik, the way of making, the style of drawing in batik, to the history of batik Jombang, and the discussion of Jombang motif that has been there before. All this information is adapted from various sources of literature both print and digital about batik Indonesia and batik Jombang.

B. Book Structure Theory

The general book structure theory according to Wiji Suwarno in his book entitled *Perpustakaan & Buku: Wacana Penulisan dan Penerbitan* is divided into 3 parts, namely cover, preliminaries page covering title, copyright, table of contents, introduction and content page, and postliminaries page cover, glossary, attachment, index, bibliography and author biography.

C. Layout Theory

Layout theory based on book "Layout Dasar dan Penerapannya" by Surianto Rustan. Layout is divided into 3 elements, that are text elements, visual elements, and invisible elements. Text elements consist of title, subtitle, deck, body text, pull quotes, captions, initial caps, header and footer, running head, and masthead. The visual elements include photos, images, artworks, infographics, lines, boxes, insets, and points. Invisible elements consist of margins and grids.

D. Typography Theory

Typography based on James Craig consists of 5 types of Roman with classical impression, Egyptian with a solid impression, San Serif with modern impression, Script with a relaxed impression, and Miscellaneous with a decorative impression.

E. Photography Theory

There are several theories of photography techniques used in this research are human interest, potrait photography, landscape photography, macro photography, and still life photography.

F. State of the Art

The book titled "Panduan Batik Tulis Tulis" by Mustar Sidiq is about batik making steps, coloring process, ornament type, and variety of isen-isen on batik. This book is reviewed with simple and concise grammar making it easier for readers to understand it.



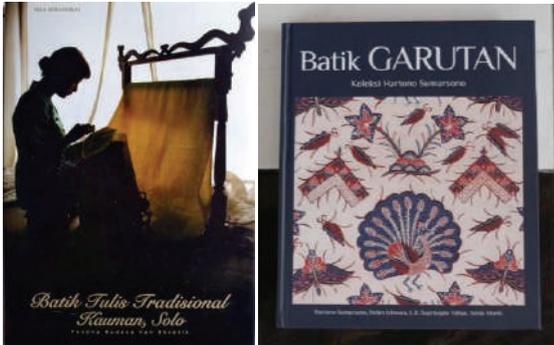
Picture 2.1. Buku Panduan Teknik Batik Tulis (Source: Alesti, 2016)

G. Comparator Review

There are 2 comparator reviews applied in this research namely batik comparator and visual book comparator. Batik comparator review about batik products Jethis Sidoarjo and batik Komar West Java, both batik products are studied based on motifs and colors used as study materials on the process of designing batik motifs. The comparator's review of visual books examines books that deal with similar objects that have been previously published. Books made comparator is a book *Traditional Batik Kauman, Solo and Batik Garutan*. Of the two books are reviewed content, layout, visual elements, and typography that later became the basis in determining the design criteria.

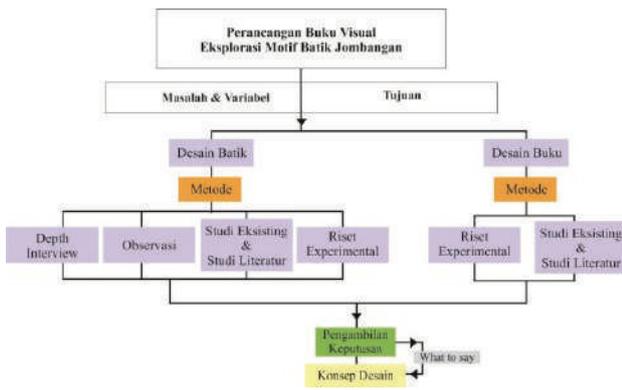


Picture 2.2 Batik Komar and Batik Jethis (Source: Alesti, 2016)



Picture 2.3 Batik book used as comparator (source: Alesti, 2016)

3. METHODS



Picture 3.1. Riset Procedure Chart (Source: Alesti, 2017)

There are two aspects that become the focus of research in this design process, that are about design of batik motif and about visual book designing. There are different research methods used in each research focus.

In research on batik design, primary data collection using several methods such as depth interview, field observation, and experimental study. Depth interview was conducted to find out the process of designing Jombang batik motif, batik making, distribution process, type and variety of batik in Jombang, batik Jombang characteristics and batik Jombang history. Depth interview conducted to DISPERINDAG Jombang District, Cultural Office of Jombang regency, batik craftsmen in Jombang, as well as to Jombang cultural.

Field observations were conducted at centers of batik making in Jombang Regency to observe the process of making batik from the beginning to become a cloth with a slick motif and the distribution process from craftsmen to sold.

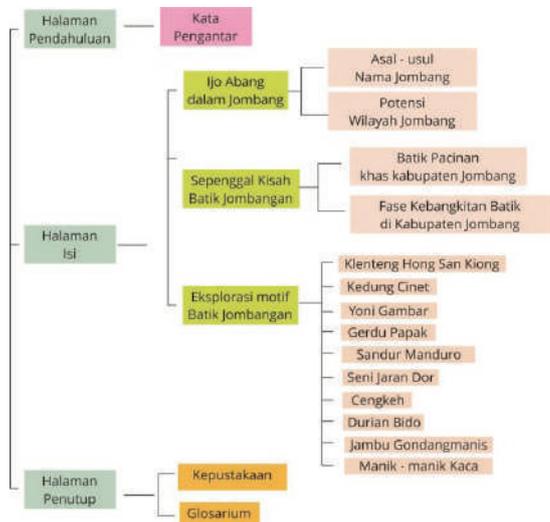
Experimental study is done by testing the results of design sketches of batik motifs to the culture and some batik craftsmen in Jombang Regency to get the design of batik motifs in accordance with the characteristics and characteristics of Jombang Regency.

4. DESIGN CONCEPT

A. Design Concept

Big idea of this design is "Jelajah Pesona Batik Jombang" which is then divided into 3 main parts namely cruising, charm, and batik Jombang style. Overall the combination of the 3 main parts has a meaning as an invitation to explore or trace the charm of the various potentials of Jombang Regency through the beauty of batik Jombang style on this visual book. Through the design of batik motifs that are designed later can strengthen the identity of Jombang and display the distinctive character of batik Jombang.

B. Content Structure



Source 4.1. Content Structure Chart (Source: Alesti, 2017)

The structure and content of the book is determined based on the results of the depth interview analysis conducted on the stake holder. The content in the visual book consists of 3 main sections, the introductory page, the content page, and the cover page. The introductory page contains the preface, the contents page contains 3 main chapters

5. DESIGN IMPLEMENTATION

A. Visual Element

Photo

The photographic elements in this book are applied in chapters 1 and 2 using several photography techniques such as human interest to capture portraits of batik craftsmen, landscape photography to portrait Jombang District, Still life photography to potray the tools of batik process, macro photography to capture the motive picture of batik Jombangan.



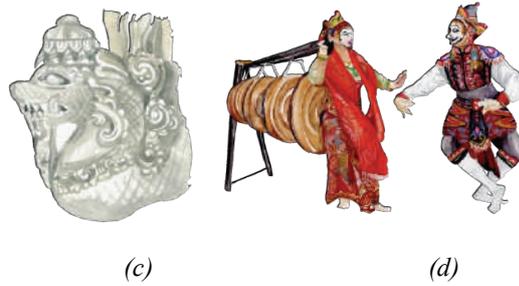
Picture 5.1. Macro photography result (left) and human interest (right)



Picture 5.2. Still life photography result (left) and landscape photography result (right)

Illustration

The illustrations used in this book use the concept of realist illustration with water color techniques that describes 10 potentials of Jombang Regency including Durian Bido, Jambu Gondangmanis, Cloves, Yoni Gambar, Gerdu Papak, Jaran Dor Jombangan, Sandur Manduro, Hong San Kiong Temple, Kedung Cinet, and Gudo Jombang Beads.



Picture 5.3. Illustration of Durian Bido (a), Jaran Dor (b), Yoni Nagaraja (c), and Sandur Manduro (d)

B. Text Elements



Picture 5.4 Chapter Title Impementation

Chapter Title

The chapter title consists of a letter component that composes a sentence that describes the contents of the chapter and adds a line element as a supporting visual element to add aesthetics.



Picture 5.5 Implementation of Sub Chapter, Pullquotes, bodytext, folios, kickers, pictogram and page numbering

1. Supergraphic

To add aesthetic impression on the layout of the book, then the design of this book will be added supergrafis in the form of batik ornaments that are adapted from ornaments motif Jimbangan Candi Ngrimbi. Supergraphis will be applied to some main pages containing subheadings and some pages that have too much white space.

2. The title of the sub-section

The Section title consists of a composition of only letters that display the outline content of the

information discussed. The sub-section uses a smaller font so it shows the.

3. Pullquotes

Pullquotes applied to the book using Futura Bk BT font with size 16 pt and placed between the sub-headings and bodytext

4. Body text

The font type used in bodytext is Futura Bk BT 10 pt font with leading of 14 pt. In bodytext use initial caps on the first letter at the beginning of each sentence with the Futura Bk BT font of 19 pt.

5. Kickers

Kickers are applied on the left side of the opposing book page. Fonts applied to the kickers use Futura Bk BT fonts

6. Folios

Folios as a section that explains the title of the book on each page is placed in the middle of the bottom side of the page. Font used for writing folios using ont Futura Bk BT with size 8 pt.

7. Pictogram and page numbering

The pictogram applied to the book serves as a decorative ornament showing the chapter on the page, and placed on the right / left side of the page numbering.



Picture 5.6 Pictogram design on visual book

C. Content

a. Batik layout

In this design also displays a variety of new motif design Jombang formulated from 10 types of potential areas of Jombang Regency with the design view as follows:



Picture 5.7 Design of Batik Motif *Beksan Jaran Dor*



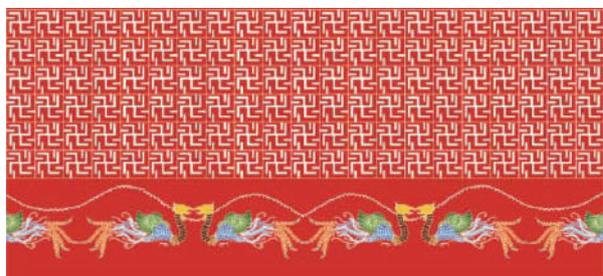
Picture 5.8. Design of Batik Motif *Jaranan Ndadi*



Picture 5.9. Design of Batik Motif *Wiji Cengkeh*



Picture 5.10. Design of Batik Motif *Gondangmanis*



Picture 5.11 Design of Batik Motif *Mamuk Hong*



Picture 5.12. Design of Batik Motif *Watesan Yoni*

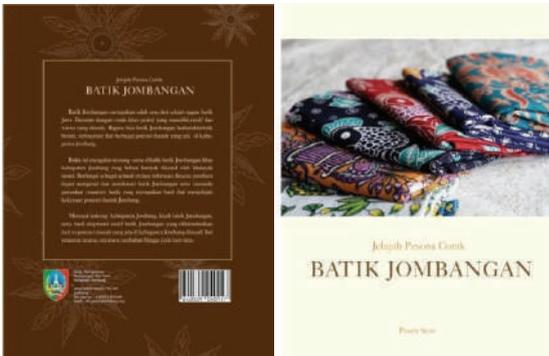


Picture 5.13. Design of Batik Motif *Duren Mongso Kasongo*

b. Visual Book

Cover

Cover the book using a photographic element in the form of Jombang batik cloth lined up then aimed from the top so that the beauty of the fabric looks exposed with a variety of colors.



Picture 5.14. Implementation of Visual Book Cover

Chapter Revelation

Each chapter requires a delimiter or boom which serves to separate the pages of chapter one with the other chapters. The revocation pages in this book use different photographic elements between chapters



Picture 5.15. Implementation of visual book chapter revelation layout

Supporting content

Supporting content consists of chapters 1 and 2 explaining the origins of Jombang Regency and the history of batik Jombang until the history of the

re-emergence of Jombang batik with pre-existing motifs.



Picture 5.16. Implementation of supporting content layout

Primary content

The main content is in chapter 3 that discusses the results of Jombang batik motif exploration formulated from 10 types of potential Jombang area. This chapter is the main discussion in this book so it has the largest portion of discussion.



Picture 5.17. Implementation of primary content layout

6. CONCLUSION

The design of batik motif Jombang in visual book media is one effort to provide education and as a source of reference to batik craftsmen in Jombang regency so as to grow the creative climate in batik craftsmen. Final design on this design process in the form of visual book "Jelajah Pesona Batik Jombang" has been tested on the target audience of Batik artisans in Jombang regency. This trial is done to determine the extent

to which the audience can understand the information submitted by the author until then successfully put it into practice.

In the experiments that have been done, so far there is no problem in the delivery of information systems in the book. Batik craftsmen can easily understand the information conveyed because it uses a relatively short and simple grammar. In the illustration section there is also no problem because the audience had previously known the potential of the area, thus they could easily recognized the location and the place, although many are not too familiar with the various potentials of Jombang area used as batik motif design theme. In the naming section for each new batik motif, the audience takes a relatively long time to digest its name, however after they read the description, the audience becomes more familiar and enthusiastic to further explore the batik motifs.

The obstacles encountered during the testing process come from technical constraints on the type of paper used as the final print media of the design. Paper book paper 50 gsm is a thin paper and it turns out very easy to pierced ink by the printout of the previous page, so that in this book there are several sections of the page the legibility is less due to the influence of the inktranslucent on its front page.

7. REFERENCING

- [1] Bartho, B.S. 2014. *Teori Tipografi Jenis Huruf Part 1*. www.dumetschool.com retrieved at October 14, 2016
- [2] Danang Sukmana, FX Widyatmoko "Koskow", NataliaAfnita.2009.*Layout.dgi*Indonesia.com retrieved at October12 ,2016
- [3] Hariyanto, Guruh.2008. *Definisi Visualisasi, Animasi, dan Simulasi*. www.skp.unair.ac.id retrieved at October 12, 2016,
- [4] Kusrianto, Adi. (2013). *Batik Filosofi, Makna, dan Kegunaan*. Yogyakarta: Penerbit Andi
- [5] Nersiwad. (2013). *Profil Wisata Jombang*. Jombang: Porabudpar Kabupaten Jombang
- [6] Pradito, Didit, dkk. (2010). *The Dancing Peacock Colours and Motifs of Priangan Batik*. Jakarta: PT. Gramedia Pustaka Utama.
- [7] Rio Notoaryowibowo. 2015. *Batik Budaya Indonesia yang Melegenda*. www.kompasiana.com , retrieved at October 11

2016,

- [8] Suwarno, W dan M. Sandra. (2011). *Perpustakaan dan Buku: Wacana Penulisan dan Penerbitan*. Yogyakarta: Ar- Ruzz Media (AM).
- [9] Wulandari, Ari. (2011). *Batik Nusanta - Makna Filosofis, Cara Pembuatan, dan Industri Batik*. Yogyakarta: Andi Publisher
- [10] Wiwit Dyahwati, dan Fera Ratyaningrum. (2006). *Ornamen Relief Candi Rimbi sebagai Inspirasi Pengembangan Motif Batik Kabupaten Jombang*. [Ejournal.unesa.ac.id](http://ejournal.unesa.ac.id). retrieved at September 26



III. CREATIVITY AND TECHNOLOGY

Creative Accessibility Improvement of All Users in Petra Christian University Library

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Abstract — Learning environment had indirect impacts on student achievement, creating the positive attitudes, higher studying motivation and undoubtedly better performance. The accessibility aspect of the learning place was crucial for educational facility such as University Library in the higher education. On the other hand, because of the old building's design, many users found accessibility barrier in Library @ Petra University's facilities. The accessibility issue for all users was found in FGD, which include persons with disabilities, senior persons, pregnant women as well as children (USER – CENTERED principle). The Redesign of Library @ Petra was proposed based on inclusive design principles. The EQUITABLE BUT REASONABLE USE principle would be granted by the provision of assistance corner for special users, internal lift, accessible pathways and rotating spaces, accessible meeting areas and accessible toilet. The SIMPLE and INTUITIVE USE was to be fulfilled with braille – visual signage and guiding path for the blind. The LOW PHYSICAL EFFORT was applied in the lift, accessible toilets and assistance to get books in certain inaccessible areas, computers for special users (blind users) were provided for reading, to access e – book and catalogue. The PREVENTION OF USAGE ERROR principle was proposed in the voids' 150-cm height railing and anti-slip flooring.

Keywords – Creative reuse, Accessibility, Disability, Pregnant Women, Senior Person, Children

1. INTRODUCTION

Learning environment had indirect impacts on

student achievement, creating the positive attitudes, higher studying motivation and undoubtedly better performance. (Chan, 1996).¹ One of the aspect of creative and sustainable learning space was the

accessibility aspect.

University Library was an important facility for learning process in higher education. On the other hand, because of the old building design, many users of Library @ Petra University found accessibility barrier inside the facility. The accessibility issue for all users was found during the discussion in Library @ Petra Christian University (which involved persons with disabilities, senior persons, pregnant women as well as children).

Every human rights was found equally important in the United Nations' Convention on the Rights of Persons with Disabilities (May 2008, underlining the persons with disability's rights). Therefore a strategy to empower, to remove barriers (so that they can participate in their community's activities), to get quality education, to find decent work, and and to have their voices heard must be conducted. (Hartley, et.al., 2011).²

Disability is a condition of human impairment which happens to almost everyone, whether temporary or permanent. The condition actually increases functioning difficulties, in the older age. And disability became an important feature as the demographics of societies change and more people live to an old age (Zola [1989], Mishra & Gupta [2006] and Lee [2003] as quoted in Hartley, et.al, [2011]).³ World Report on Disability 2011 has highlighted that more than one billion people in the world live with different disabilities, of whom nearly 200 million experience heavy functioning difficulties. And it was predicted that disability will be a greater concern because of the aging populations and the higher risk of chronic health conditions such as diabetes, cardiovascular disease, cancer and mental health disorders (Hartley, et.al, 2011).⁴

According to Indonesian Regulation: UU Republik Indonesia No. 8 Tahun 2016 (Law of Indonesian Republic No. 8 Year 2016)⁵ The Indonesian government guarantees every citizen, including persons with disabilities that they have the same legal status and human rights with other Indonesian citizens. Therefore this project is very important for improving the capability of lecturers as well as the students in any design for all people. Besides that 1,46 millions of Indonesian is disabled persons (0,74 % from 197 million of total Indonesian population, according to the National Social and Economic Survey showed that in 2000 [Indonesian Statistic Centre Bureau, 2001]).⁶

As mandated in the Law of Indonesian Republic No.

8 Year 2016 to provide disability service in the educational facility, persons with disabilities (lecturers, students and staffs), senior persons (probably lecturers, staffs and parents), pregnant women (lecturers and staffs), as well as children (lecturers' and staffs' children and visitors) would need equal and safe access to the Library of Petra Christian University (Library@Petra). Therefore, the Improving Accessibility of All Users in Petra Christian University Library program was proposed.

2. LITERATURE AND THEORY

To ensure the success of accessibility transformation in Petra Christian University's Library, several methods were needed to be explored, such as: Universal Design, Inclusive Design and Participatory Design.

Universal design is defined as not only faithful to the accessibility codes and standards, but also produce comfortable design environments for wider users (Nasar, Evans-Cowley. ed., 2007). Some principles of universal design were equitable use, flexibility in use, simple and intuitive use, perceptible information, tolerance for error, low physical efforts, and size and space for approach and use; would improve liveability and quality of life for everyone (Preiser & Ostroff, eds., 2001).⁷

Secondly, Inclusive design was defined as "the design of mainstream products and/or services that are accessible to, and usable by, as many people as reasonably possible without the need for special adaptation or specialised design." Inclusive design should be included in the earliest design process (The British Standards Institute, 2005, quoted in <http://www-edc.eng.cam.ac.uk/betterdesign/>).⁸

Lastly, Participatory design was a design approach attempting to actively involve all stakeholders (e.g. employees, partners, customers, citizens, end users) in the design process to ensure the product design meets the needs and is usable. And it has focus on processes and procedures of the design (<http://cpsr.org/issues/pd/>).⁹

Levine, (ed). (2003) suggested library as Cultural Facilities in the NYC Guidebook to Accessibility and Universal Design. Cultural facilities had to provide information and knowledge access to everyone. The site design of the project should provide pathways, loading zones, and parking lot -- which have minimum requirements. Universal design requirements can improve access to the cultural resources.

Irvall & Nielsen, (2005), suggested a checklist of access to libraries for persons with disabilities. In order to provide equal opportunities for all library users, a checklist was developed by the IFLA Standing Committee of Libraries Serving Disadvantaged Persons (LSDP). Therefore all parts of the library, the entrance, restrooms, stairs, elevators and special rooms should be accessible for persons with different disabilities. A person in a wheelchair should be able to reach all departments, a visually impaired person should be able to walk with a cane or a guide dog and find his/her way without bumping into obstacles. A deaf person should be able to communicate with library staff. A person with an intellectual disability should be able to find books and other materials easily. A person with dyslexia or other reading problem should be able to find his/her way around. Therefore, a universal design of the library was very important.

Robertson (2012) highlighted the Library as a central service which needed to accommodate all students' needs with different supports for a wide range of diversity. Library staffs should proactively examine their policies and practices to remove barriers for the disabled with: e.g. making accessible formats on the web pages to enable the use of screen-reader software, and longer loan periods to compensate the students with slower reading speed caused by visual impairments or dyslexia. Improvements could also be made by improving signage, layout, renewal methods and instructional guides.

Physical access, signage, acoustics and accessibility should be considered at the planning stage to anticipate people with mobility problems, a range of disabilities, hearing impairments and visual impairments. Physical access was vital since it connects the indoor and outdoor parts of the building; therefore it should accommodate the needs of all disabilities. It is valuable for staff to understand accessibility regulations as well as giving information about widths and heights of various accessibility elements, color schemes and visibility (Robertson, 2012).¹⁰

The Washington University Library also proposed library services such as a designated staff member and/or committee who coordinates services for persons with disabilities, monitors adaptive technology developments, and responds to requests for accommodation. The University suggested to provide a written description of services for persons with disabilities, including procedures and information on how to request special

accommodations. The service required such as: (<http://www.washington.edu/doi/universal-access-making-library-resources-accessible-people-disabilities>).¹¹

One of accessibility aspects is the room lighting. The lighting would improve the learning performance as well as users' comfort, that could be described as pleasant, colourful, light, modelled, restful, quiet, soft, cozy, relaxing, warm, (Phillips, 2000).¹²

Understanding the importance of the access for all in Library@Petra, a Multi-disciplinary Team consisting Library Management, Interior and Architecture Lecturers were formed and the SERVICE LEARNING courses were redeveloped to facilitate all users including persons with disabilities, senior persons, pregnant women, as well as children.

3. DATA AND METHODS

Table 1 Methods and Outputs of the Program

No	Activities	Outputs
1	Literature Review	Database of Users Spectrum of Petra Christian University
2	Mapping of all users spectrum (including person with disabilities, senior persons, pregnant women and children) in Petra Christian University (PCU)	Interview
3	Documentation of Petra Christian University (PCU) library accessibility	More empathy from the librarians, lecturers and students towards person with disabilities
4	Sensitivity training for librarian, lecturers and students to understand all users' needs (including person with disabilities, senior persons, pregnant women and children)	Library Accessibility Audit
5	Student's Universal Design for User Assistance Corner (serving person with disabilities, senior persons, pregnant women and children) in Petra Christian University Library	Users Assistance Corner
6	Architectural Model	Model for Workshop

	Making for Workshop support	
7	Participatory Workshop for Library Design with students	Design inputs from students
8	Participatory Workshop for Library Design with person with disability	Design inputs from persons with disability
9	Participatory Workshop for Library Design with senior persons	Design inputs from senior persons
10	Participatory Workshop for Library Design with pregnant women and children	Design inputs from pregnant women and children
11	Lecturer's Universal Design of the library (for person with disabilities, senior persons, pregnant women and children) [including lighting and interior design]	Accessible Library Design (6th floor and User Assistant corner)
12	Professional Video Shooting and Editing	Video of disability service corner and profile of Petra's students with disabilities
13	Create assistance program for people with disabilities, especially in adaptive technology and simple accommodation that would be developed in disability service corner	Assistance program, especially in adaptive technology and simple accommodation that would be developed in disability service corner
14	Conduct creative campaign for User Assistance in Library @ Petra Christian University	Website, bulletin, more empathy from all students
15	Conduct creative campaign with accessible library design guideline for Government's Libraries and Community Libraries (simple guideline)	Accessible library design guideline for Government's Libraries and Community Libraries (simple guideline)
16	Final Reporting	Final report

Literature review was conducted by lecturers and students involved in the program. Accessible

standards and library standards were evaluated. Case studies were also collected from several secondary data to support /prescribe accessible library design guidelines. Unfortunately, many literatures only covered universal design standards for developed countries. Only a few researches in accessible education / facilities were found. Many of them portrayed the accessible design for developed countries which were expensive to implement. Some papers were found compatible because of the level of accessibility prescribed. In NY Urban design guidelines, two level of accessibilities prescribed (Universal design and accessible design). On other standards, visit-able design and accessible design were introduced. But, it could be concluded that for old buildings such as Library @ Petra, there were certain locations that could not be 100% accessible. So the main areas such as receptions, catalogues, special collections should be 100% accessible. The other areas could be visited or visit-able.

In the process of the users' spectrum mapping in Petra Christian University, several users with special treatment were found in the PCU campus. The PWDs became the important spectrum in campus. The number of PWDs in Petra that could be found are quite numerous. Mostly because of sports accidents, traffic accidents or diminishing health, so they became temporarily disabled. The temporary PWDs were found in the PCU students, PCU staffs as well as guests arriving in Petra.

All users of Library@Petra including persons with disabilities, senior persons, pregnant women, as well as children would benefit from this program. The persons with disabilities were still a minority in Petra. Some spectrums found were the wheelchair users, crutch users, deaf as well as partially visual impaired persons. Persons with temporary disabilities were occasionally found. They were facing temporary disabilities because of sports accidents or traffic accidents. Therefore, their safety aspect should be improved in the Library@Petra.

Documentation of PCU Library and simulation as PWDs were conducted in August 2016 and January 2017. The documentation were conducted involving Architecture and Interior Students. The general documentation was executed to find problems and possible conceptual solutions. Meanwhile, simulation as PWDs was conducted to understand the limitation of design as well creating empathy in the students mind.



Figure 1. Documentation and Simulation as PWDs



Figure 2. Documentation and Simulation as PWDs

In January 2017, a more well-rounded documentation was conducted by lecturer and 2 students from Architecture Dept. to draft the existing buildings and existing furniture. It was conducted to utilise the existing furniture in the building as much as possible. This step also in line with the Green campus concept adopted PCU leaders in 2010.

Student's Universal Design for User Assistance corner layout redesign, lighting redesign were conducted in September – December 2016. The design was conducted by KKP Desain Inklusi (Inclusive Design Service Learning course), and Sosiologi Desain (Design's Sociology), Sains Tata Cahaya (Lighting Design Science) in first stage.



Figure 3. Students' universal design process



Figure 4. Review of Students' universal design with Dr. Arina and Senior Persons in PCU

The lecturer's Universal Design was conducted in January – March 2016. The design was conducted in integrated term (Interior – Architecture and Library management). The scope of the design involved the layout redesign, the assistance corner furniture design, the lighting redesign. Unfortunately because of time limitation, only 6th floor that got redesigned in detail. The 5th, 7th and 8th floor were only considered / designed generally. Additional lift were proposed to create accessibility to all floors.

The participatory design workshop were conducted several times involving students, persons with disability, senior persons, pregnant women, women with babies and also children. The workshops were differentiated for sensitivity training, initial need assessment, and final design review. The sensitivity training were conducted in January 2017 (for librarians) and in February 2017 (for students). The sensitivity training involved experts of disability services such as Dr. Arina, Mr. Tutus MPd., Mr. Syukur and Mr. Sulendra.



Figure 5. The sensitivity training for librarians and students



Figure 6. The participatory design workshop involving students, persons with disability, senior persons, pregnant women, women with babies and children



Figure 7. The participatory design workshop involving students, persons with disability, senior persons, pregnant women, women with babies and children

The need assessment workshops were conducted in October / November 2016 two times. The first workshop involved students and person with disabilities (The PWD with visual disability, PWD with physical disability, wheelchair and crutch users). The deaf PWD were not involved because of limited availability of PWD. Beside that the limited impact to the design were found such as: signage design and alarm light as the sign of emergency. The second workshop involved students, senior persons (lectures), pregnant women and women with babies (female lectures), and children (elementary school –

children of staffs and lectures). The workshops gathered the needs of special users.



Figure 8. The person with physical disability and parent contributed to participatory design workshop



Figure 9. The senior persons contributed to participatory design workshop



Figure 10. The architectural model as media for participatory design workshop for explaining to persons with visual disability

The final design review (participatory workshop) was conducted in March 2017 involving all special users spectrum. The workshop produced confirmation and positive inputs to refinement of the design. To create a successful communication, an architectural interior - architecture model was prepared by students. The models were used for design communication with PWD with visual disability.

Professional photo and video shooting was conducted from August 2016 to May 2017. The documentation was conducted by professional to

create a campaign video. The video would be published in inclusive design (<https://desaininklusiukpetra.wordpress.com/>) blog as well as Library@Petra website, and exhibition of the program in Library@Petra.

Professional 3D illustration and professional interior Architecture modelling were also conducted in April – May 2017. The professional results would enhance the impact of the accessible design to the librarians, architects, interior designers and High Educational Institutions Leaders in Surabaya so they would attend the seminar. The seminar would be held in August 2017.

The guideline of the Accessible University's Design was proposed with illustration. The design was adopted from the participatory design process. The guideline would be disseminated through Library @ Petra website to be downloaded by many campuses librarian / campuses structural leaders. The design illustrated the universal as well as accessible design. The prescription would be implemented in the old library building as well as new library. The guideline also would be disseminated through seminar in August because we need to confirm the time availability with campuses structural leaders (Vice Rectors Forum of East Java).

The creative campaign for user Assistance Corner in Library @ Petra was conducted in April – May 2017. The publication was disseminated through Library @ Petra, DIVO (Digital Media of PCU) as well as through mass media. The campaign was started in 12th of April 2017. It involved 4 special users to try to borrow books, to access the library service, assisted by librarians and 8 students. Lastly, several papers and final reports would be written to report the process of the program.



Figure 11. The creative campaign for user Assistance Corner, with service for person with disabilities and senior persons



Figure 12. The creative campaign for user Assistance Corner, with serving person with disabilities and senior persons



Figure 13. The creative campaign for user Assistance Corner, with serving person with disabilities and senior persons

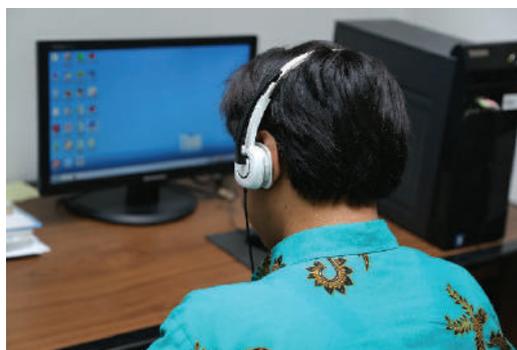


Figure 14. The talking computers serve persons with visual disabilities



Figure 15. The exhibition of research – action results



Figure 16. The exhibition of research – action results and visitation from UBCHEA

4. RESULT AND DISCUSSION

The Layout Redesign of Library @ Petra was proposed following the inclusive design and universal design proposal. The design was produced following the USER – CENTERED principle, considering the need of persons with disabilities, senior persons, pregnant women, women with babies and children. The design considers social accessibility as well as physical accessibility.

The Library @ Petra was located in Radius Prawiro Building (In Building) 5th, 6th, 7th, and 8th floor. The library could be accessed in the 6th floor, but the other floor could not be accessed by lift because the security measures implemented by Library @ Petra management. Therefore to fulfill the **EQUITABLE USE BUT REASONABLE**, an internal lift was proposed in the future. The lift was going to be proposed in the shaft / void in the centre area of the library.

The **EQUITABLE USE BUT REASONABLE** Principle was also implemented with providing accessible pathways / corridors (clear width of 100 cm) and rotating space (with 150 cm clear width radius). This pathway and rotating spaces reduced the sitting areas and some storages in the building. On the other hand, more meeting areas (open or secluded) were provided to facilitate discussion in the Library. Accessible toilet was proposed replacing male toilet in the 6th floor.

The third principle applied was **SIMPLE and INTUITIVE USE**. The principle was applied with a proposed simple circulation. The circulation could not be changed but could be simplified and emphasized with signage for all users and guiding path for blind users. The assistance corner for special users was located in the back of the sitting area in library, but it was emphasized with other tool (sign and guiding path).

The fourth Principle of **LOW PHYSICAL EFFORT**

was applied with a proposed lift, accessible toilets and assistance to get books in the inaccessible bookshelves. On the other hand, important books such as reference could be accessed in 6th floor. Additional computers for special users (especially blind users) were provided to assist them reading and accessing e – book and catalogue website.

The fifth Principle **PREVENTION OF USAGE ERROR** was proposed in the voids and the newly-proposed accessible toilets. The voids was protected with glass railing. The railing was proposed with 150 cm height. The accessible toilets would be equipped with railing, anti-slip floor, sitting toilet and sliding doors.

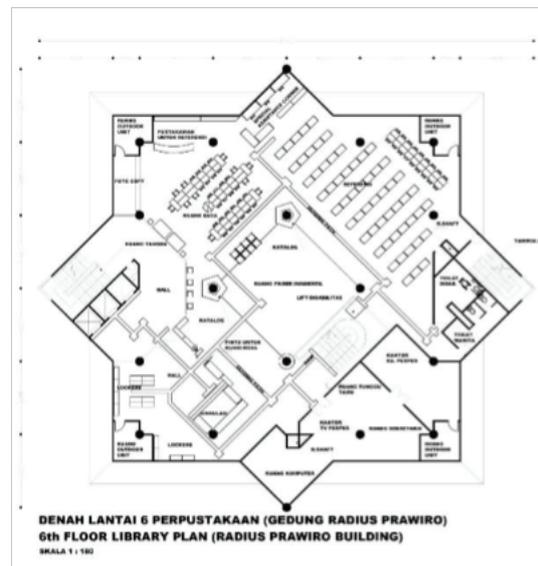


Figure 17. The 6th floor plan of Library@Petra



Figure 18. The Main Entrance of Library@Petra in 6th floor

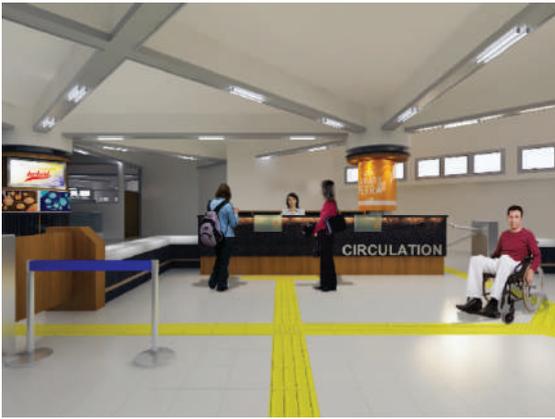


Figure 19. The Lobby and Circulation Desk



Figure 22. The Sitting Area and Reference Desk



Figure 20. The Locker for keeping users belonging



Figure 23. The additional desk lighting for Sitting Area



Figure 21. The Temporary Exhibition Space in 6th floor



Figure 24. The Special Assistance Corner in the 6th floor



Figure 25. The Special Assistance Corner and Special Catalogue (Talking) Computers



Figure 28. The Toilet for Persons with Disabilities



Figure 26. The Bookshelves and corridors with 1m clear width



Figure 29. The Railing in 7th Floor with 150cm height



Figure 27. The Future Internal Lift for Special Users

So it can be concluded that the new layout was proposed considering inclusive and universal design principles. The physical improvement to the Library@Petra would be proposed gradually to accommodate especially the PWDs, and as an application of Indonesian Law no 8 year 2016 on Person with Disabilities.

5. CONCLUSION

Library@Petra as the university library affected the student especially in the accessibility aspect. On the other hand, because of the use of existing building, accessibility barriers were present. The accessibility issue for all users was found involving persons with disabilities, senior persons, pregnant women, women with babies and children. The new layout of Library @ Petra was proposed following inclusive design and universal design principles in the creative participatory program.

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Hartley, S., Ilagan, V., Madden, R., Officer, A., Posarac, A., Seelman, K., Shakespeare, T., Sipos, S., Swanson, M., Thomas, M., & Qiu, Z., eds. (2011), *World Report on Disability 2011*. World Health Organization. ISBN 978 92 4 068521 5 (PDF).

Indonesian Statistic Centre Bureau, (2001), *National Social and Economic Survey*

Irvall, B., Nielsen, G.S., (2005), *Access to libraries for persons with disabilities – Checklist*, IFLA Professional Reports, No. 89, International Federation of Library Associations and Institutions, <http://www.ifla.org/files/assets/hq/publications/professional-report/89.pdf>

Lee, R. (2003), *The demographic transition: three centuries of fundamental change*. *The Journal of Economic Perspectives*, 2003,17:167-190. doi:10.1257/089533003772034943

Levine, D. (ed). (2003), *UD New York 2, The NYC Guidebook to Accessibility and Universal Design*, Center for Inclusive Design & Environmental Access, University at Buffalo, The State University of New York.

Mishra, A.K., Gupta, R., (2006), *Disability index: a measure of deprivation among the disabled*. *Economic and Political Weekly*, 2006, 41:4026-4029.

Nasar, J.L., Evans-Cowley, J. (Ed).(2007), *Universal Design and Visitability: From Accessibility to Zoning*, National Endowment for the Arts and The John Glenn School of Public Affairs, Columbus, Ohio.

Phillips, D., (2000), *Lighting Modern Buildings*, Architectural Press, Oxford. UK,

Preiser, W., Ostroff, E., eds., (2001) *Universal Design Handbook*. McGraw Hill, New York, USA.

Republic of Indonesia (2016), *Act no 8 of Year 2016 on Person with Disabilities*, (Undang-Undang Republik Indonesia Nomor 8 Tahun 2016, Tentang Penyandang Disabilitas).

Robertson, L., (2012), *Access for Library Users with Disabilities*, SCONUL, London, UK.

The British Standards Institute, (2005), *British Standard 7000-6:2005. Design Management Systems - Managing Inclusive Design* quoted in <http://www-edc.eng.cam.ac.uk/betterdesign/>.

REFERENCES

Chan, T.C. (1996), *Environmental Impact on Student Learning*, Valdosta State Coll., GA. School of

Zola I.K., (1989), Toward the necessary universalizing of a disability policy. The Milbank Quarterly, 1989,67:Suppl 2 Pt 2401-428. doi:10.2307/3350151 PMID:2534158

<http://cpsr.org/issues/pd/>

<http://www.washington.edu/doit/universal-access-making-library-resources-accessible-people-disabilities>

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Implementation of Leg Join Mechanism on Design of Unloading Pairs Educational Toys

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Abstract — The join leg mechanism is a set of shafts and sleeves of scalable size that can turn rotational inputs into ellipses such as animal footsteps. During this mechanical join leg has not been much explored. On the other hand, the mechanical join potentially opens the space of mechanical imagination to children. Leg join mechanism can be developed into a variety of animal legs, such as mammals, arachnids, aves (poultry), etc. Then the results of the study can be used as an animal replica toy that can walk or drive. To realize the idea, it takes several mechanical study and analysis, such as leg join mechanism study, transmission systems study, and steering system analysis. This research produces the application of join leg mechanism to animal unloading pairs toys that leads kids to understand mechanical basics and construction.

Keywords – Leg Join Mechanism, Educational toys, Animal toys

1. INTRODUCTION

Leg join mechanism is a set of shafts and sleeves with scalable size that can change the input rotation to ellipse like animal footsteps. So far the Klan and Theo Jansen are artists who study the join leg mechanism intensively. One of Theo Jansen's works known as Kinetic Sculpture is Strandbeest. A moving sculpt artwork was developed since 1990. The following is the work of Theo Jansen, strandbesst, a sculpture that can move like an animal with wind motors.

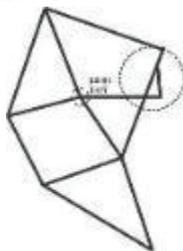


Figure 1. Theo Jansen mechanism

Jansen has so far applied his findings to artwork. On the other hand, the development

concept of simple join leg mechanism can be applied to several things such as toys. By applying it to child's toy, it can provide space for thinking and imagining especially in children aged 9 and over. Children's toys with join leg mechanism can take inspiration from different types of animals, so as to provide more knowledge of the child's movement system in animals. Educational toys that implement mechanical systems will make parents and their child work together in assembling so that the frequency of interactions between them can occur more frequently. In addition to assembling toys together, children can understand a basic principle of kinematics and mechanical construction that leads them to a positive imagination and tends to observe everything around them, from hinge systems, locks, mechanical motion modifiers in home appliances, to animals - a moving animal.

Of the several things that have been described, the design of children's educational toys that apply

the join leg mechanism has a great chance to be developed. Although in its application has a challenge on technical aspects, such as structure, transmission, and steering system. This is the background of the development of educational toy design with the exploration of join leg mechanism.

1.1. Problem

1. The educational potency of join leg mechanism that have not been utilized,
2. Technical constraints when the join leg mechanism is applied to educational toys (unloading pair toys).

1.2 Limitation

1. Leg joint mechanism which intended to is join 2 axis, x and y. Among them are Jansen foot joint, Clayton, and Klan.
2. Educational toy (unloading pairs) in this case are animal replica toy.

2 DATA METHODS

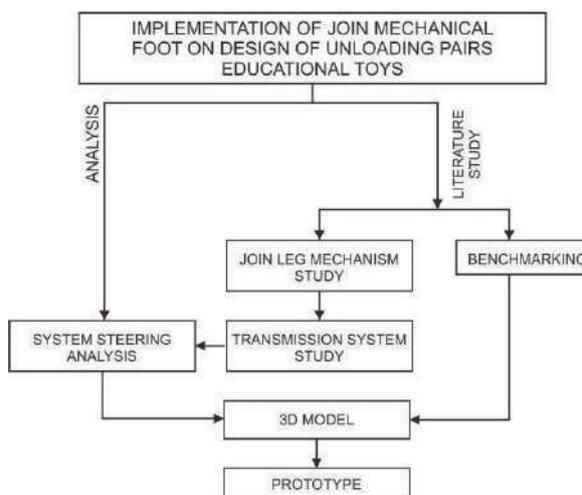


Figure 1. Research flow

2.2 Join Leg Mechanism Study

This study about a basic principle of join leg mechanism that consist of the each arm’s role in its kinematic, variables affecting footstep’s height and length, and the differences between input and output. Thus expected to be a reference in applying join leg mechanism. This study was conducted on Jansen, Clayton Bowyer, and the Linkage Klan

2.3 Transmission System Study

This study aims to reference a system that can

move all join leg mechanism to step like animal rhythms. So this study based on animal gait that transform to mechanical joint adjusting the rhythm of join leg mechanism.

2.3 Steering System Analysis

This Analysis aims to find the steering system construction on the toy, so it can be steered right and left. This experiment is done by trying two alternatives that become the steering system hypothesis.

2.4 Benchmarking

This is a comparative study of products to find out the positioning of the market from the educational toys.

2.5 3D Model

this is part of the process of formation ideation. Considering the formation must accommodate the mechanical space of motion, so the search form is easier using 3d modeling.

2.6 Prototyping

3 RESULT & DISCUSSION

3.1 Variable Mechanism Exploration

According to Syamsuddin (2017), the difference between Jansen, Clayton, and Klan linkage that should be considered when applying thus join to animal toys is at the input position [2]. Because each input position produces different outputs. The following is the differences between input position and its outputs .

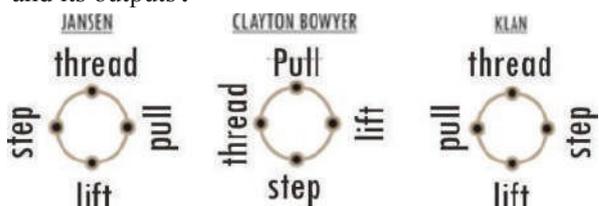


Figure 2. Difference between those three joint about input position to step output

So to produce the same output, the input position of each joint must be adjusted appropriately. For example for the Clayton bowyer joint output equal to Jansen, the Clayton input position must be rotated 90 degrees clockwise. For the Klan’s joint output to be equal to Jansen, the Klan input must be rotated in the opposite direction from the Jansen input rotation direction.

. In addition, obtained from the experimental results, that the variables that affect the magnitude of the foot step is the diameter of the circle input movement.

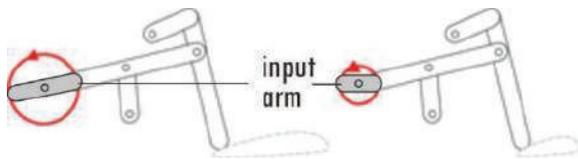


Figure 3 . Range of footstep depends on input arm length

The core arm can change height and length step on a small scale. While the Executor's arm can change the gesture of joint leg mechanism.

3.2 Transmission System Study

According to Syamsuddin (2017), Animal gait can be applied to the rhythm of leg joint mechanism through setting its input position [2]. Here is animal gait and its application to input position of joint leg mechanism.

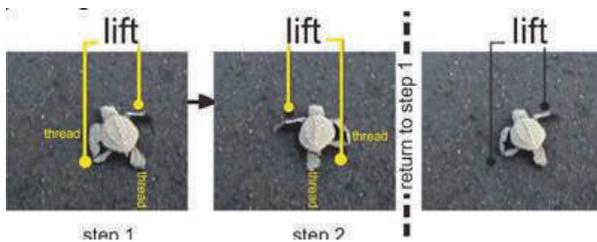


Figure 4. Seaturtles gait show in 2 (two) steps.

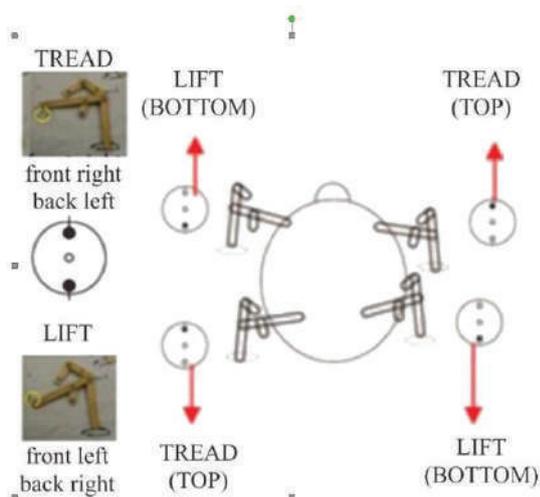


Figure 5. Leg input arm positioning according to animal gait shown in figure 4.

3.3 Steering system study

Two steering system above is possible to be realized. Here the analysis between its system.

1. Steering system with steering shaft.

To this below steering system, the constraints is exist in the Motors. The Motors should have a considerable torque to move it turn.

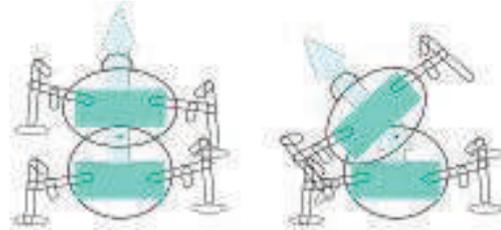


Figure 6. Steering system with shaft



Figure 7. One of system steering mock up.

2. Steering system without steering shaft.

The steering system below is required precision motor between right and left. So the footstep rhythm can be maintained when one motor is driven forward and the other motor is driven backward, the toys will rotate to its body automatically.



Figure 8. Steering system without steering shaft and its mockup.

3.4 3D model

Join leg mechanism educational toys is Unloading pairs toy that divided into 2 big parts. That are mechanical structure and body enclosure.

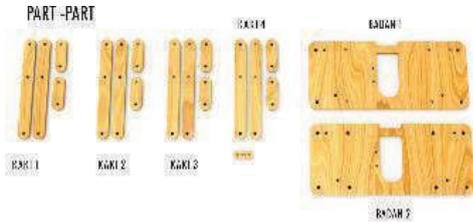


Figure 9. “Mechanical structure” part and explode view

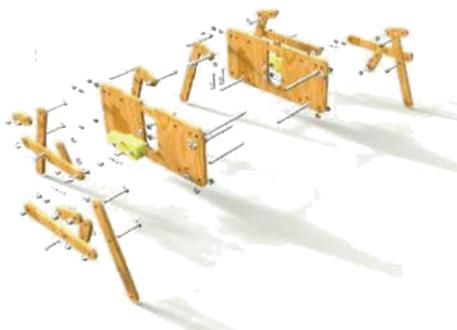


Figure 10. Mechanical Structure explode

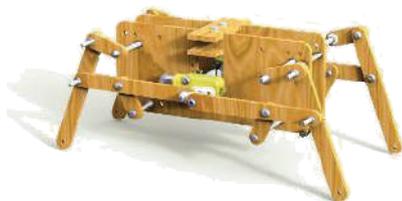


Figure 11. Mechanical Structure



Figure 12. Body Enclosure Interchangeability



Figure 13. Mechanical structure and Its Body Enclosure

Here is prototype of design result. This prototype is consist of mechanical structure and body enclosure. In this prototype shown that this toys is Still too big to carried by child. In fact this measure I get from adjusting the volume of the need for mechanics part and component. So to get a smaller size must be passed by research to replace the construction used in this mechanical system.



Figure 14. Prototype

4. CONCLUSION

The conclusions of this design are:

1. Join leg mechanism can be developed into educational toys.

2. Technical constraints when Join leg mechanism is applied as educational toy on a small scale (unloading pairs) are:

- In moving toy required two motors. One motor moves the right leg, another motor moves the left leg. The obstacle is that the existing motor does not have the same speed although the electrical current input is same.

- Stepper motor is a dc motor controlled by digital pulses, so that the motor cannot move when there is no program that sends pulses of digital form. As a result these motors tend to be precision compared to the motor usually. The downside is its very slow speed. The stepper motor with a normal speed like the speed of the motor has a size and load is much larger.

3. Technical constraints when joint mechanism is applied as an animal replica toy is a disruption of utility mechanisms when following the form and proportion of the animal reference. So dividing educational toys into 2 parts, mechanical structure and body enclosure can help its mechanics run stable.

4. The areas further research is in developing construction to be easier to operate by child and make them all smaller than its size. Besides that the joint leg mechanism can be applied to other animals like mammals, and aves. Also can be applied in animals that have legs more than 4 (four).

Bowyer, Clayton (n.d.) Retrieved 21 Desember 2016 from <http://www.lisaboyer.com/Claytonsite/robotlaboratory.htm>

Leg Joint Mechanism (n.d.) Retrieved 21 Desember 2016 from https://en.wikipedia.org/wiki/Leg_mechanism

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REFERENCES

Brown, Henry T.(1896). Five hundred and Seven Mechanical Movements, Newyork:Brown and Seward.

Gessinger, G. H. (2009). Materials and innovative product development: using common sense. Burlington MA. Butterworth-Heinemann.

Martin, Bella. & Hannington, Bruce. (2012). Universal Methods of Design. Rockport Publishers

Kurniati, Euis (2013). Program Bimbingan untuk Mengembangkan Keterampilan Sosial Anak Melalui Permainan tradisional. Pendidikan karakter, 18

Syamsuddin, M.Chanif & Zulaikha, Ellya (2017). 'Penerapan Joint Mekanis Kaki pada Perancangan Mainan Binatang Tunggalan'. Jurnal Idea,

Design Low Cost 3D Holographic Display for Indonesian Museum – Pyramid Form

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Abstract - 3D hologram is one of new technology that used to deliver information, education, promotion, advertising, and games. A survey noted that, 60,8% respondents confirm about the importance of 3D hologram technology as an effective tool for teachers, while 45,5% believed 3D hologram technology will be an effective teaching tool for the future. And 47,3% teacher in all stages education mentioned that 3D hologram technology could not change the face of education, but can support them in teaching. The rapid development and dissemination of digital technologies in the everyday life is applied of museum exhibitions has the potential to significantly improve the enjoyment of cultural heritage contents by the visitors, who may be increasingly actively involved in the cultural artifact exploration.

Keywords: *3D Holographic, Museum, Low Cost*

1. Introduction

3D hologram is one of new technology that used to deliver information, education, promotion, advertising and games. A survey noted that, 60,8% respondents confirm about the importance of 3D hologram technology as an efficient tool for teachers, while 45,5% believed 3D hologram technology will be an effective teaching tool for the future. And 47,3% teacher in all stages education mentioned that 3D hologram technology could not change face of education, but can support them in teaching (Ghuloum, 2010). The rapid development and dissemination of digital technologies in the everyday life is applied of museum exhibitions has the potential to significantly improve the enjoyment of cultural heritage contents by the visitors, who may be increasingly actively involved in the cultural artefact exploration (Bovier, Caggianese, De Pietro,

Gallo, & Neroni, 2016). This motivate the authors to applied the 3D hologram technology in Indonesia especially in muesum. Indonesia has more than 300 museum an every province in Indonesia has their own museum Which became a window of local cultural information (Direktorat Pelestarian Cagar Budaya dan Permuseuman, 2015). But the artifact in the museum can't give information of education value to visitor (Fabrizia Bovier, 2016).

survey we have done in museum in Indonesia, Indonesian student in elementary school is rarely come to the museum this is because museum cant give interactive leraning to the visitor and they don't give optimal education value .We can develop this technology to increase visitor specialy elementary school student and give them new experince.

2. Problem Statment

The public awareness of the museum is low and the museum appreciation to stakeholder is low too. The Museum also does not yet have an appeal that makes the museum a major destination to visit in leisure or holiday time and Lack of local government attention to the management of the museum (Direktorat Pelestarian Cagar Budaya dan Permuseuman, 2015).

Furthermore, from the observations in several museums in Jakarta, the museums are not enough to provide information related to the collections that they have. The information limitations have made visitors ultimately do not get the 'spirit' of the collections who are on the displays. There is not enough information on the names of the collections that are on displays and on the history of the collections. There is no

various information that can provoke the curiosity of visitors. As such information is not provided, visitors generally only make the museums' collections as photography

objects and photography backdrops, making the collections do not have the spirit of educational information (Purbolaksono, Hermanto, Amelia, & Syahayani, 2015).

3. Methodology

There was many kind 3D hologram technology, one of them used pepper's ghost Illusion principle. National Archaeological Museum in Naples and Archaeological Museum of Bologna apply it to Displays a collection of artifacts, their build the display on their own version an shows in (Bovier,

Caggianese, De Pietro, Gallo, & Neroni, 2016) (Fischnaller, Guidazzoli, Imboden, & De Lucia, 2015).

Hologram effect can be obtained using a low cost. Selection of suitable materials results in producing a clear image of hologram at four sides (Ramlie, 2017).



Figure 3-1. Example of Pepper's Ghost Illusion 3D Holographic in Museum (Bovier, Caggianese, De Pietro, Gallo, & Neroni, 2016) (Fischnaller, Guidazzoli, Imboden, & De Lucia, 2015)

The experiment of that authors do is used 5 inc monitor with different form of pyramid to see how are the projection on pyramid layers. The target of this

experiment is the object (the girl on video) look llike stand on the base of pryramid not a floating image.

Table 1

Summary of Pepper's Ghost Illusion on 3D Holographic Projection.

<i>Authors and Years</i>	Bovier, et al. 2016	Perozo, et al. 2016	Eksperimen I	Eksperimen II	Eksperimen III
<i>Projector</i>	40 inch monitor	21 inch monitor	5 inch monitor	5 inch monitor	5 inch monitor
<i>Ratio Projector</i>	-	-	16 : 9	16 : 9	16 : 9
<i>Lokasi Projector</i>	Top of pyramid	Bottom of pyramid	Bottom of Pyramid	Bottom of Pyramid	Top of pyramid
<i>Sudut reflector dari garis normal</i>	45°	47°	45°	30°	45°
<i>Material Reflector</i>	-	Gaussian holographic optical	PLA with clear mica	PLA with clear mica	Acrylic clear

<i>Side of reflector layer</i>	3	3	4	4	4
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Table 2
Summary of blueprint trapezium from pyramid construction.

<i>Authors and Years</i>	<i>Projector</i>	<i>Base Length</i>	<i>Side Length</i>	<i>Slant Angle</i>	<i>Drawing</i>
Perozo, et al. 2016	21 inch monitor	64,5 cm; 10,54 cm	39,26 cm	47 °	
Experiment 1	5 inch monitor	18 cm; 3 cm	12,903 cm	45 °	
Experiment 2	5 inch monitor	18 cm; 3 cm	12,903 cm	30 °	
Experiment 3	5 inch monitor	6,35 cm; 1,27 cm	45,45 cm	45 °	

Table3
Comparison of Material

Material	Picture	Material price calculation
ABS with 3d printing		Material used (gr) x 2500
PLA with 3d printing		Material used (gr) x 2500

Acrylic		(material used (mm) x ...) + (cutting time (mnt) x 4000)
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4. Result and Discussion

Tabel 1
Result of projection on pyramid form

<i>Authors and Years</i>	<i>Projector</i>	<i>Slant Angle</i>	<i>harga</i>	<i>Projection</i>	<i>Explanation</i>
Experiment 1	5 inch monitor	45 °	(gr) x 2500		The girl on video is look like floating, image on pyramid stand up straight, material of the pyramid is solid black PLA with clear mica. The projection image is clear and bright
Experiment 2	5 inch monitor	30 °	(gr) x 2500		The girl on video is look like floating and the projection image still far form the base of pyramid, image on pyramid layer is distortion, not stand up straight, material of the pyramid is solid black PLA with clear mica. The projection image clear and bright
Experiment 3	5 inch monitor	45 °	13.000		The girl on video is look like stand on the base of pyramid, stand up straight, but the image look like more less opacity.

5. Conclusions and Recommendations

The conclusion of this paper is the technology of 3d holographic can be a new media to invite Indonesian people specially elementary student to go to the museum. In

other work this technology can complete the limitation content of the museum with 3d hologram video. The pyramid with four side allow the visitor to see 360° , The use of acrylic material allows the manufacture of pyramid be come cheaper.

REFERENCES

- Bovier, F., Caggianese, G., De Pietro, G., Gallo, L., & Neroni, P. (2016). An Interactive 3D Holographic Pyramid for Museum Exhibition. *12th International Conference on Signal-Image Technology & Internet-Based Systems*. Italy: IEEE. doi:DOI 10.1109/SITIS.2016.73
- Direktorat Pelestarian Cagar Budaya dan Permuseuman. (2015, May 11). *Info Budaya: Permasalahan dan Tantangan Pengembangan Museum*. Dipetik August 12, 2017, dari <http://kebudayaan.kemdikbud.go.id>
- Dre, D., & Dogg, S. (Pemain). (2012, April 15). *Coachella 2012*. Empire Polo Club, Indio, California, United States of America.
- Fischnaller, F., Guidazzoli, A., Imboden, S., & De Lucia, M. A. (2015). Sarcophagus of the Spouses Installation Intersection Across Archaeology, 3D Video Mapping, Holographic Techniques Combined with Immersive Narrative Environments and Scenography. *Digital Heritage 2015*. Spain: IEEE. doi:10.1109/DigitalHeritage.2015.7413903
- Ghuloum, H. (2010). 3D Hologram Technology in Learning Environment. *Proceedings of Informing Science & IT Education Conference (InSITE) 2010*. Manchester, UK. Dipetik August 3, 2017
- H+Technology. (2015). *HOLUS AT HOME*. (H+Technology) Dipetik August 2, 2017, dari H+ Technology: <https://hplustech.com>
- innovation.rocks consulting gmbh. (2016, August 5). *Portofolio: Hologram*. (innovation.rocks consulting gmbh) Dipetik August 2, 2017, dari innovation.rocks: <https://innovation.rocks>
- Palmer, R. (2012, April 17). *Technology: Science*. Dipetik August 3, 2017, dari International Business Times: <http://www.ibtimes.com>
- Polk, C. (2012, April 15). *license/142964552*. Dipetik August 3, 2017, dari Getty Images: <http://www.gettyimages.com>
- Purbolaksono, A., Hermanto, M. R., Amelia, L., & Syahayani, Z. (2015, October). The Indonesian Update. (A. W. Poesoro, Penyunt.) *Volume IX, No. 11*, hal. 19.
- Ramlie, M. K. (2017). Developing A Low-Cost 3D Hologram For A New. *The 6th International Conference on Social Sciences and Humanities 4-6 April 2017, Malaysia*, (hal. 535). Malaysia.

Design of Postural Equipment on Wheelchair for Children with Cerebral Palsy

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Abstract — Children with cerebral palsy (CP) have muscles that are smaller, weaker and more resistant to stretch compared to typically developing people CP refers to a permanent condition, however, children can learn to cope with the condition as they grow. Treatment often brings about improvement, such as occupation treatment. Occupation Treatment can happen at special school. The development of the number of children with CP is also quite high. Based on the National Institute of Neurological Disorder and Stroke (NINDS) data obtained 2 -3 infants per 1000 births suffered from CP. In Indonesia of children with CP is approximately 5.5 per 1000 with the same balancing ratio in gender. Children with CP have the different need for their body, such as bad postural. The Objective of this research was to investigate the effect of postural equipment on postural stability and study activities efficiency in children with cerebral palsy. Specifically designed seat postural equipment was used. Four postural equipment was used in this study: 1) seat postural equipment, 2) three different system of side supports, 3) desk, and 4) study equipment. Children with Cerebral Palsy at SDLBD YPAC Surabaya are included in this study. The Result of our study demonstrated that the postural equipment have effect on the study activity in children with cerebral palsy and recommended postural equipment design of students with cerebral palsy in study activities. Side support systems that help to correct children with CP's posture.

Keywords – *i.e.* Comfort, the Postural and self-confident design of seat postural for a wheelchair.

1. INTRODUCTION

Cerebral palsy (CP) is one of the chronic diseases characterized by nonprogressive disorders of posture and motion. Spasticity causes posture disturbance, motion control, balance and coordination so it will disrupt the functional activity of children with CP [1].

The development of the number of children with CP is also quite high. Based on NINDS data obtained 2 -3 infants per 1000 births suffered from CP. In Indonesia of children with CP is approximately 5.5 per 1000 with the same balancing ratio in gender [2]. At primary

school age estimated at 1.2 to 2.5 children per 1000 children [3].

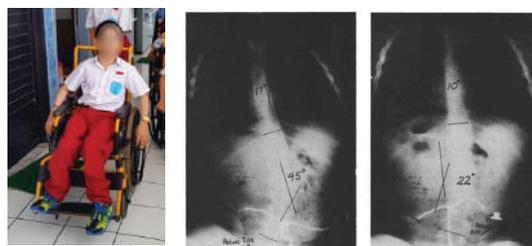


Figure 1. Lateral tilting of the pelvis in the direction.

In the brain of children with CP, there are 3

different parts that work together to run and control the work of muscles that affect the movement and posture [4]. Children with CP have limitations to control the muscle work that causes posture that can slow the process of increasing the ability of the patient and can cause long-term effects such as bone disease [5]. CP with a heavy phase aspect still requires supervision of the pelvis and hips including the addition of a belt to work optimally.[6]

2. LITERATURE REVIEWS

The three forces needed to maintain the position of the pelvis and lumbar spine are the thigh support, lap belt constrain, and lumbar support [6].

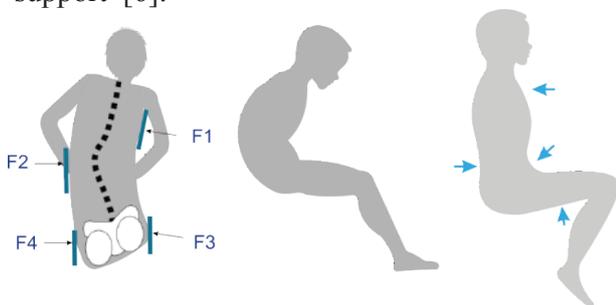


Figure 2. A Sagittal View (a), Picture that illustrating the pelvis in posterior tilt posteriorly (b), The four forces needed to maintain the position of the pelvis and lumbar (c)

Products with good uphill height but there should be no taper angle to provide security for the user. It takes under a holder with a height of 12-15 degrees with a safe dull corner to meet the needs of the child with CP. [6]. In figure 3 described some degree incline of the seat bottom.

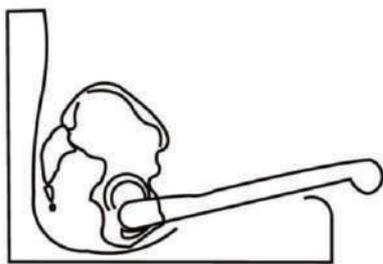


Figure 3 Seat Bottom with some degree incline.

Study of component based on Gross Motor Function Classification (GMFCS) or the level of CP child's condition compared to their needs.

Based on the analysis, it can be concluded that the features needed for CP diplegia phase II and III are postural equipment on wheelchair that consist of : **seat postural, side support, belt, and upper desk.**

Table 1. Classification and need of Cerebral Palsy

GMFCS	Ability	Component Features Need
Level I	Affected one limb only, walk independently with poor balances, different in leg length	Normal Desk and Chair
		Fix Product
		Safety Product
Level II	Affected one side of the body, walk with assistive device without help	Side Support
		Length Handle
		Easy to use product
Level III	Walk with assistive device with help, contractures of ankle and feet, may also contracture on hip knee, Affected both of leg	Adjustable ankle desk
		Side support
		Ergonomis Product
		Adjustable Product
Level IV	Move with assistive device with help with limited aspect, affected both leg, or hand may also contacture but active	Side support
		Belt
		Headrest
		Angle adjustable desk
		Hand Equipment
Level V	Move with full help. Have the biggest effect	Side Support
		Belt
		Headrest
		Headbelt
		Hand equipment
		Angle Adjustable Seat

3. DATA AND METHODS

Research methods can be described in the Table 2 as can be seen below:

Table 2. Research Table

Reference Research		This Research	
The effects of product performance in children with hemiplegic cerebral palsy (Kavak, et al. 2009)	Seating For Children And Adults With Cerebral Palsy (Carlson, et al. 1986)	Design of Postural Equipment on Wheelchair for Children with Cerebral Palsy	
Product	Desk	Seating	Postural Equipment
Component	Cutout desk	Seating, belt	Postural equipment on wheelchair
Level of CP	CP Spastik Level 2-3	CP Diplegia Level 3	CP Diplegia Level 2

Based on Tabel 2, the design method can be determined as the figure below. With this method, design activities, and usability test all the process based on design requirement and objective after that prototyping will be used to user usability test.

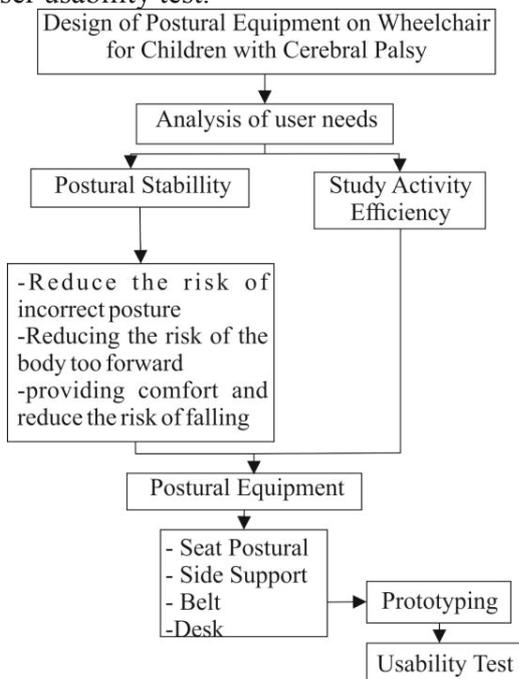


Figure 6. Design Method

4. RESULT AND DISCUSSION

Our design cannot be all thing to all people, but we will most nearly approach the ideal by keeping our solution. The main aim of this research is to make a better design of postural equipment with a wheelchair for postural stability and study activity efficiency. The main component are outlined below.

4.1 Seat Postural Equipment

Define The are two variant for this seat postural equipment that includes with backrest cushion, seating cushion, and headrest.



Figure 2. Seat Postural Design

4.2 Side Support

There is three variant for this side with adjustable concept : lock system, stop and go system, (c) thread.



Figure 10. Lock System Side SupportC



Figure 11. Stop and Go System Side Support

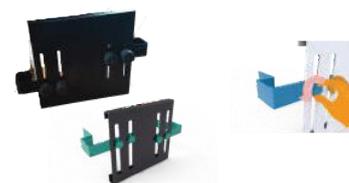


Figure 12. Thread System Side Support

4.3 Belt

There is three variant for the belt that using material fabric, spon, and sloop . The design is applicable too for seat postural equipment as it adjustable application in material and component.



Figure 13. Belt

In order to extend the safety quality, Belt uses to be effective, must address the right position of study activity.

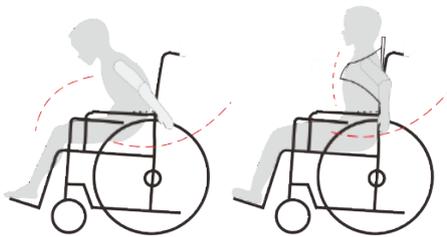


Figure 14. Belt that address the right position

4.4 Upper Desk

The desk is one of the most important components in postural equipment especially at study activity. The desk product can be used as a standing table or the equipment, contained in the wheelchair. This research using the desk equipment . It using wood and magnetic material in accordance with the needs of children CP that can't control their books and paper that easy to fall,improve the study activity efficiency there are also equipped with equipment such as magnetic tool and pencil.



Figure 15. Upper Desk Equipment

User Evaluation always include an product and a therapist in addition to the user, parent or caretakers, and, if available, a physician.



Figure 16. Usability Test

Based on the figure above, it can be seen that the development of the product already met the ideal prototype plan.

5. CONCLUSION

There are several conclusions of the design answer the problems that have been described in .The conclusion obtained after the prototype produced one wheelchair and table equipment and implemented usability test to students in SLDB YPAC Surabaya and conducted interviews to prospective customers such as :

- A. After conducted the analysis in the form of usability test obtained the result that 2 of 3 students in one class is the wheelchair user, so it was decided that prototype making focused on making seat postural equipment with wheelchair frame.
- B. Postura Design can meet the problems that have been described with the description as follows:
 - a. Support CP Child Posture in some parts
 - i. Side Supports, by supporting the waist in accordance with user needs.
 - ii. Front, by supporting the chest part of the belt.
 - iii. Back, supporting the back end of the backrest cushion.
 - iv. Down, supporting the thigh and lumbar parts of the bottom seat.
 - b. Facilitate learning facilities, namely:
 - i. Design table with adjustable angle system.
 - ii. Cutout desk design, to facilitate the wheelchair or seat entry zone with a magnet function so that goods are not easily dropped.

ACKNOWLEDGMENT

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REFERENCES

- [1]Potts, Nicki L., and Barbara L. Mandlco. Pediatric nursing: Caring for children and their families. Cengage Learning. 2012.
- [2]Chambers, H. G. "Treatment of functional limitations at the knee in ambulatory children with cerebral palsy." *European Journal of Neurology*. 2001: 59-74.B.
- [3]Grether, Judith K., Susan K. Cummins, and Karin B. Nelson. "The California cerebral palsy project." *Paediatric and perinatal epidemiology* 1992: 339-351.
- [4]Parker, D. F., et al. "Muscle performance and gross motor function of children with spastic cerebral palsy." *Developmental Medicine & Child Neurology* 1993: 17-23.
- [5]Bajraszewski, Enver. *Cerebral Palsy : Guide For Parents*. 1989.
- [6]Carlson, J.Martin. *Seating For Children And Adults With Cerebral Palsy*. The American Academy Of Orthotists And Prosthetists, 1986.
- [7]Janssen-Potten, Yvonne JM, et al. "Chair configuration and balance control in persons with spinal cord injury." *Archives of physical medicine and rehabilitation* . 2000: 401-408.
- [8]Kuswanto, Djoko, Niamah, Syukriyatun and Rahma, Farah Aulia. *Development of Orthosis Design for Spastic Cerebral Palsy Through Biomechanical Approach*. 2016

Seating Design for Patient's Visitor at Public Hospital

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Abstract — Public hospitals are government's public health service that are prioritized to serve the inhabitant in their own region. In order to provide good health service in their own region, regional public hospitals should be able to compete with private hospitals, especially facing the demand of technology in the field of health services which is balanced with the local culture, based on the local people habit. Indonesia is a country which has high solidarity. This solidarity is also reflected in hospital. It is common for hospital patient for being accompanied all the day with one patient carer. This carer is usually the patient's family or fellows. In addition, patient is usually being visited by their fellow, neighbor, or friend in hospital. Carer and visitors are an important part of the recovery process and are welcome in hospitals. They can help people recover faster, and also help reduce their anxiety and stress. However, the attendance of carer and visitor causes problems. The problem comes up when the number of furniture in the room is less than the number of room user. These activities lead to slums and crowded atmosphere. Multifunction seat can be the solution of these problems to maximize spatial function at the hospital in order to support health service process. The ability to create efficient seat makes people feel comfortable in a space which can improve the productivity and support the psychology of carer, patient, and visitor as well.

Keywords – ergonomics, public hospital, seating

1. INTRODUCTION

A public hospital or government hospital is a hospital which is owned by a government and receives government funding. In some countries, this type of hospital provides medical care free of charge, the cost of which is covered by government reimbursement. [1] As a general hospital serving a wide range of social strata in society and serve the health facilities that are quite complex. This leads to the condition of the hospital's crowded and filled with a variety of activities.

Physics conditions and psychological conditions (inner mind) of man plays role in healing process. Both have contribution in the process of healing. To support the patient's psychological conditions need to create an environment that is healthy, comfortable, in a sense psychologically positive support environment for the healing process.

In Indonesia, where the people has high family solidarity, patient in the hospital is usually accompanied by their

family or relative. Family members view that people who are supportive always ready to give help and assistance if needed (Friedman, 1998 in Friedman, 2010). In essence families are expected to work to realize the development process of mutual love and affection among family members, between relatives, as well as between generations which is the basis for a harmonious family. Bonds of affection in the family is a happy home.[2]

In the other hand, there is no facilities or space for carer's accommodation. This condition leads some unpleasant habit to be seen in the hospital patient room. The carer usually sleep or sit on the floor which creates slums on the floor or wall. In addition, this activity can cause health risk for the carer such as rheumatic, nosocomial, etc.

Environment as a system containing a particular stimulus, will customize a human to perform a specific behavior patterns. Through the design of furniture, an interior can shape the behavior of the carer and visitor. As a limited space, patient's room needs multifunction seat which can

be used for several activities in one furniture unit. The aim of carer's seat design is to accommodate family visit as well as the relationship of the patient.

2. PROBLEMS

2.1. How do hospital furniture can encourage the good communication and interaction between patients, medical personnel, and patient's visitor?

2.2. How do hospital furniture can stimulate the visitor behavior in order to maintain the cleanliness, comfort, and hospitality?

3. METHOD

3.1. Data Collection

The aim of data collecting is to strengthen the problem issues from the selected object. In this case, the accommodation for carer and visitor is needed to stimulate good behavior as hospital user. Primary data is collected through hospital observation and interview with hospital user in a public hospital. Secondary data is collected through journal, book, and online literature.

3.2. Study and Analysis

3.2.1. Activity Analysis : required as reference of user's requirement for the furniture.

3.2.2. Layout Analysis : required as reference of dimension limit of the furniture .

3.3.3. Ergonomics Analysis : required as reference of standard dimension.

3.3.4. Material Analysis : required as reference of suitable material for certain furniture requirement.

3.3. Design concept

In this part, the accompanist's seat is designed based on the analysis process.

4. DISCUSSION

4.1. Activity Analysis

Based on Indonesian culture which has high solidarity with family and fellow, patient in Indonesian hospital is often visited and accompanied during healing process in hospital. These family and fellow bring good psychological effect and support to the patient.

The number of patient visitor is varied. Patient visitors visit in group or couple. These group show up as group of the family member, neighbor, classmate, or work fellow whom have close relationship with the patient. The average number of the patient visitor is between three until seven people in one visit group.



Figure 4.1. Visiting work fellow in hospital.

Source : <https://kendyferdian.files.wordpress.com> (accessed on 15/08/2017 at 17.00 PM)

During visiting time , some visitor may need chair to seat. This condition will make visiting atmosphere more friendly, neat, and not too crowded. Standing position fulfills the space between visitor's head and ceiling. The free space is narrower than visitor with sitting position.

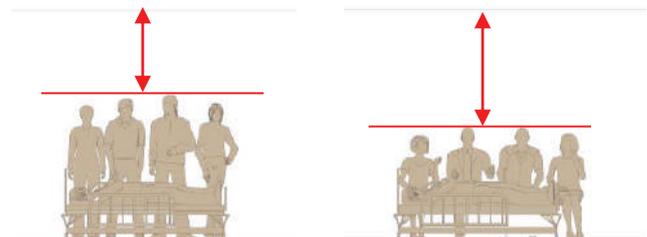


Figure 4.2. Left to right

Visitor in standing position, visitor in sitting position.

Source : Masyithah, 2017

Besides being visited with scheduled time, patient is also accompanied by their family or fellow 24 hours. The attendance of the carer is important to help patient need which is not included as nurse's job. The number of patient carer is limited only one person and usually this carer gets card or tag identity.

What is more, because there is no accommodation for patient carer. The carer tend to sleep on the floor with or without mat. This activity may lead the carer to several health risk, as example rheumatic and nosocomial. All in all, it is needed to provide multifunction bed and chair for patient career and visitor accommodation.



Figure 4.3. Mother accompany her daughter in the kid patient room

Source : http://cdn2.tstatic.net/makassar/foto/bank/images/pasien-dbd-lantor-2_20160208_141056.jpg (accessed on 15/08/2017 at 17.00 PM)



Figure 4.4. Patient carer use a mat for sleeping on the floor

Source : Masyithah, 2016

4.2. Layout Analysis

The room dimension and room capacity should be able to meet the minimum requirements. The minimum area for patient room is 7.2 m²/ bed. [3] To prevent infection between patient, there should be space between bed to bed.

This space can be used for some furniture , for example : storage and patient career’s seat.

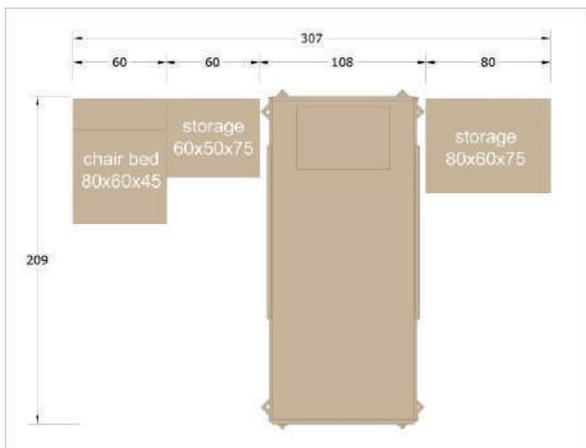


Figure 4.5. Example of furniture layout with chair bed

Source : Masyithah, 2017

4.3. Ergonomy Analysis

The height of the furniture as bed is 42 cm from the floor. This height is based on bed dimension standart. The free space on the lower area tend to be the clearance for cleaning reason.



Figure 4.6. Bed dimension

Source : Human Dimension and Interior Space

Due to the minimum space, the length of the furniture is

60cm. This length is based on the dimension of shoulder breadth. While for the bed width is based on 95% percentile Indonesia body height, which is 180cm.

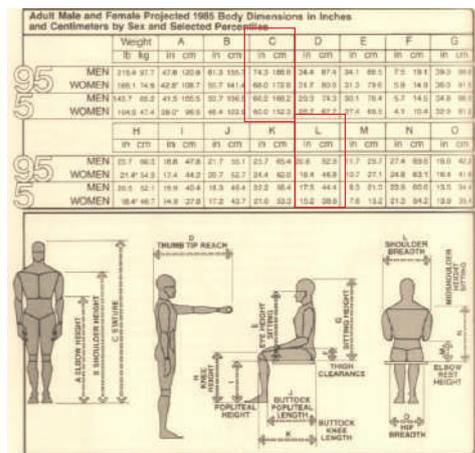


Figure 4.7. Body dimension

Source : Human Dimension and Interior Space

Because of many hidden psychology factors involved, the actual efficiency of sitting type in term of capacity is questionable. The diagram indicates two possible seating situation, each dictated by the anthropometrics involved. One arrangement is based on the premise that the user's elbows will be extended, possibly in conjunction with some activity, such as reading, or simply as an attempt to stake out additional territory, as would be the case in the strategic positioning of some personal article on the seat. In this situation it would be reasonable to assume that each user would take up about 30 in, or 76.2 cm, of space. The other diagram shows a more compact seating arrangement. [4]

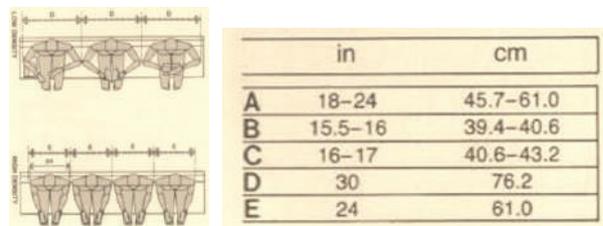


Figure 4.8. Banquette setting

Source : Human Dimension and Interior Space

4.4. Design Concept

The accommodation for patient carer is a multifunction furniture which can turn into chair and bed.



Figure 4.9. Chair turns into bed for carer accomodation

Source : Masyithah, 2017

This furniture is semi knock down because it contains three modules in one furniture. Based on medical activity on the patient bed for example injection, infusion, etc, this furniture should be able to be moved easily to the right or left of the bed side.

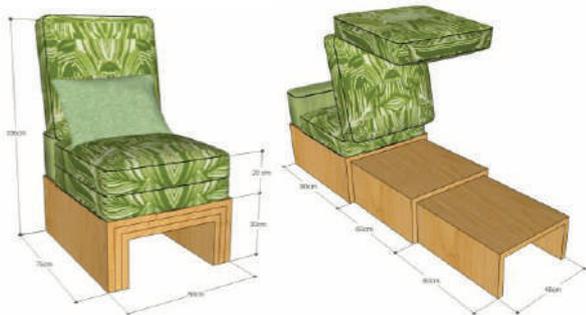


Figure 4.10. Furniture dimension as chair and bed

Source : Masyithah, 2017

To accommodate more number of visitors, the furniture is made with borderless and armless concept. This concept can lead flexible border between people. It is also applied for the cushion detail which is edgeless. The edge of the cushion may create imaginary border when sitting.



Figure 4.11. Seat cushion with edge

Source : [http://1.bp.blogspot.com/-](http://1.bp.blogspot.com/-YF11zVoM0Oo/Vibvt39Jj2I/AAAAAAAAADF4/2W0YSvRqztM/s640/cushion--box%2Bedge.jpg)

[YF11zVoM0Oo/Vibvt39Jj2I/AAAAAAAAADF4/2W0YSvRqztM/s640/cushion--box%2Bedge.jpg](http://1.bp.blogspot.com/-YF11zVoM0Oo/Vibvt39Jj2I/AAAAAAAAADF4/2W0YSvRqztM/s640/cushion--box%2Bedge.jpg) (accessed on 17/08/2017 at 19.00 PM)

While edgeless cushion is more flexible to be seated on.



Figure 4.12. Edgeless seat cushion

Source : <https://secure.img1-fg.wfcdn.com/im/9633e713/resize-h800%5Ecompr85/3045/30451822/Knife+Edge+Outdoor+Sunbrella+Lounge+Chair+Cushion.jpg> (accessed on 17/08/2017 at 19.00 PM)

5. CONCLUSION

Overall, according to design process, it can be inferred some conclusions:

5.1. Public hospital is prioritized to accommodate citizen health service with different background.

Indonesia which has high family solidarity has visiting and accompanying patient habit. Accompanying and visiting habit is good for patient as psychological support.

5.2. However, this habit leads to some problems. Patient carer has been sleeping on the floor while accompanying patients and it leads to slums and crowd.

Carer need proper furniture as accommodation. Multifunction chair-bed can be a solution for this problem. The bed can be turned into chair to save space.

5.3. This accommodation give carer a better psychology and health environment. This furniture stimulates carer to have proper sleeping and sitting position which can prevent some disease while being exposed to hospital atmosphere.

5.4. The chair-bed furniture is also can be used for visitors accommodation. The seat is designed borderless and armless to provide flexible spaces.

REFERENCES

[1] https://en.wikipedia.org/wiki/Public_hospital (accessed on 15/08/2017 at 17.00 PM)

[2] Suryawantie, Tantie., Karnoto, Juni, Setiawan. 2015. *The Relationship Between The Family Support With Medication Adherence For Mental Disorder Patients In Sukamerang Primary Health Care Garut 2014*. Bandung : The 3rd International Conference Culturally Sensitive Intervention in the Delivery of Health Care Professionals to Encounter Globalization Era

[3] Direktorat Bina Pelayanan Penunjang Medik Dan Sarana Kesehatan Direktorat Bina Upaya Kesehatan Kementerian Kesehatan Ri. 2012. *Pedoman Teknis Bangunan Rumah Sakit Ruang Rawat Inap*. Retrieved December 27th 2016 from <http://aspak.yankes.kemkes.go.id/beranda/wp-content/uploads/downloads/2014/01/5.-PEDOMAN-TEKNIS-RUANG-PERAWATAN-INTENSIF.pdf>

[4] Panero, Julius, AIA,ASID, dan Zelnik, Martin, AIA,ASID. 1979. *Human Dimension and Interior Space*. New York : Whitney Library of Design

The Lighting Studies Of Computer Laboratory Towards Building Direction

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Abstract — Lighting is an important factor to a room. With proper lighting users will feel comfortable in doing the work so as to increase user's productivity. To improve use productivity, indoor lighting needs to be adjusted to meet the needs of its user. Setting of light becomes important in that case and to response that, a study of daylight and articial lighting in a classroom is needed as that room is the place for studying. In this research shown the relationship between light and building direction. The object that used as a case study is Classroom 306 of known as Computer Laboratory of Building R Department of Interior Design Institut Teknologi Sepuluh Nopember (ITS).

Keywords – Lighting, laboratory, interior, building direction

1. INTRODUCTION

Lighting in the interior is very important because it can affect the people's mood that affect the level of productivity in work.

Lighting in the room should be done by combining natural lighting in the form of sunlight and artificial lighting in the form of electrical lights. The use of artificial lighting in the form of lights will release energy, therefore it is necessary to optimize natural lighting sources as well as the direction of buildings to minimize electrical energy.

Room 306 Computer Laboratory Building R Interior Design Department is a space that is widely used for teaching and learning process that displays images / visuals that are strongly

influenced by the lighting factor in the room. Good and proper lighting will affect people to work more productively and can support better visual images. Lighting methods based on SNI (Indonesian National Standard) are used to determine ideal lighting for buildings especially in Indonesia.

Institut Teknologi Sepuluh Nopember is a campus that almost all activities are based on information technology and multimedia, so rely on electrical energy, especially for teaching and learning activities. The lighting system optimization depends not only on the opening of light (natural lighting) or on electrical energy (artificial lighting). It needs

a combination of both for the lighting system to run well and visual comfort in the classroom can be achieved which can ultimately improve student performance in the classroom.

In this research will contain about the condition of natural lighting and artificial lighting (lux) that affect the convenient of the computer user in it with the current building direction and condition.

The purpose of this research is to analyze natural and artificial lighting in the computer laboratory. Then compare with SNI standard and the direction of the building so that the user can do activities well in the room and efficient in electrical energy consumption.

2. LITERATURE AND THEORY

To ensure the success of this research, several method are needed to explored including the effect of color, artificial lighting, and natural lighting.

a. Effect of building direction towards natural lighting

The influence of natural light source on buildings in Physics Building book (2008), stated that, "In the design of the building, the laying of window holes should be applied more on the north and south side of the building. While application of windows on the east and west side should be avoided, especially on the western side of the building due to sunlight from the west side of the building because the sun's light from the west is quite hot and sting. One of the effects of natural light on buildings is the temperature intensity of direct sunlight that can increase wall temperature due to conduction and room temperature when direct sunlight enters the room. "

b. Building envelope

Building envelope is a building element that envelops the building of transparent or non-transparent walls and roof (regulation of the Provincial Governor of the Special Capital Region of Jakarta No. 38 of 2012).

Energy savings in the building envelope can be obtained by (SNI 6389-2011):

- *Changing the color of wall paint from dark color to a lighter color*
- *Using double glazed windows*
- *Using insulation on walls and roof*
- *Reduce the comparison figures outside window and outer wall*
- *Using the shield on the outside window*

The influence of natural light source on buildings in physics building book (2008), stated that, "In the design of the building, the laying of window holes should be cultivated more on the north and south side of the building. While laying windows on the east and west side should be avoided, especially on the western side of the building due to sunlight from the west side of the building because the sun's light from the west is quite hot and sting. One of the effects of natural light on buildings is the temperature of the intensity of direct sunlight that can increase wall temperature due to conduction and room temperature when direct sunlight enters the room. "

c. Artificial lighting

Based on SNI 63-6575-2003 (2003), several matters governed in the Procedures for Designing an Artificial Lighting System in Building Buildings are as follows:

- *The magnitude of the coefficient of use is influenced by the light intensity distribution factor of the armature, the ratio of the light output of the armature to the light output from the lamp inside the armature, the reflectance of light from the ceiling, the walls and the floor, and the installation of armatures whether attached or suspended on the ceiling dimensional room.*
- *The magnitude of the depreciation coefficients is influenced by the cleanliness of the lamps and armatures, the cleanliness of the surface of the room,*

the decrease of light output during the time of use, and the decrease of the light output due to the voltage drop.

- *In the selection of lights there are two things to note, namely the visible colors expressed in the color temperature and color effects expressed in the color rendering index.*
- *The efficiency of the lamp or so-called luminous efficacy.*
- *Tests carried out for checking, observing and measuring are testing the level of illumination and testing of glare levels.*

d. Lamp efficiency

Selection of the right light source or lamp is essential in lighting design to create a comfortable interior atmosphere and save energy. There are a number of characteristics of light sources to consider when designing lighting:

- *Efficiency of light source (luminous efficacy).*
- *Lamp life.*
- *Color rendering index (CRI).*
- *Light color (correlated color temperature - CCT).*

e. Efficiency of armature

The effectiveness of the lighting system is also determined by how well the light generated by the lamp can be distributed by armature. This efficiency is measured by a Light Output Ratio (LOR), which is the ratio between the lumen output of the lamp and the total lumen distributed out of the armature.

f. Lighting system and the principle of design

Color of light and color rendering index are light color indicators and how the color of an object is seen under the light. While it does not directly affect energy consumption, light colors and color-generating indices are very

influential in visual comfort and lighting quality. For example, sodium lamps (high pressure and low pressure sodium lamps) have very high efficiency but are very bad in terms of color-producing index (CRI), so they are not suitable for interior applications. Most fluorescent lamps have excellent efficiency and color-generating indices (CRIs).

g. Natural lighting

Natural light is the light obtained from direct sunlight from early sunrise to sunset (Satwiko: 2004). Sunlighting is a complete process in designing buildings to utilize natural light to the fullest. It includes the following activities:

- *Placement of buildings.*
- *Formation of building mass.*
- *Choose a building opening that allows sufficient amount of light to enter the building.*
- *Protect the facades and openings of buildings from unwanted solar radiation.*
- *Added precise and adjustable protective equipment.*
- *Design lighting control of electric lights that enable energy savings by utilizing sunlight during the day.*

The natural lighting factor of daylight consists of 3 components:

- *Sky component (sky-fl factor).*
- *The external reflection component (external reflection factor - frl).*
- *The inner reflection component (reflection factor in frd).*

In SNI 03-6197-2000 on Energy Conservation in the Lighting System described in the following table:

Table 2.1

Room function	Lighting Intensity (lux)	Color renderation group	Cool White 3300K-5300K
Work room	350	1 atau 2	•
Computer room	350	1 atau 2	•

According to the above table then Classroom 306 Computer Laboratory can generally fall under the criteria of educational institutions with lighting needs of 350 lux. However, because in the room there is a faculty room, then the lecturer room included in the room with lighting standards of 350 lux. In addition to achieving the standards that have been determined to note some of the criteria are as follows: strong lighting and the relationship between the lighting with the reflectance strength of depression coefficient, coefficient of use and reflectance (SNI 03-6575-2001).

g. *Observation result*

In the laboratory room there are separater room which used as lecturer room as shown in below.

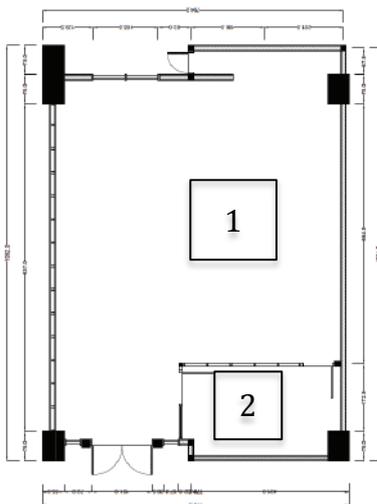


Figure 2.1 Layout

Legend:

- 1. Computer Laboratory
- 2. Lecturer Room

• *Laboratory Room*

The room has dimensions of 10.62x7.78 meters, including the lecturer room. The main access door is on the side of the wall facing south. The access door of the room and the area of the lecturer or as a whole is included in the 306 computer laboratory room using a double door with 151 cm wide effective openings.



Figure 2.2 Laboratory room

• *Lecturer room*

Light openings from outside the building in the room is on the southern wall of clear glass with jalousie. The area also has a wall opening and a partition door of frosted glass on the west and north sides.



Figure 2.3 Lecturer room

3. DATA AND METHODS

The method used is to measure the dimensions of space using a digital meter, then determine the point above the work plane to do lighting sampling using lux meter. Here are the points above the working field:

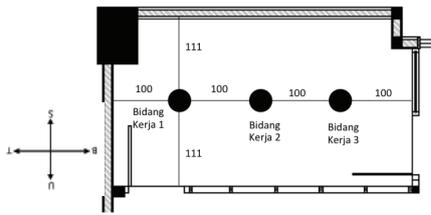


Figure 3.1 Research point of lecturer room

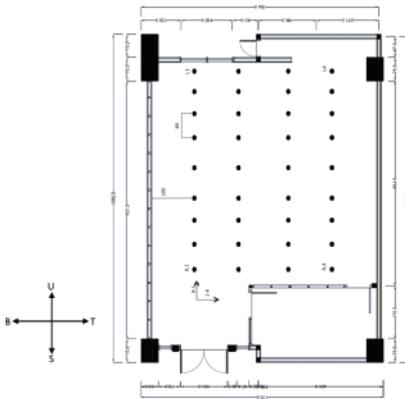


Figure 3.2 Research point of laboratory room

4. RESULT AND DISCUSSION

The author conducted a randomly distributed online interview aimed at 306 space computing lab users, and from the results of the interviews it was found that the balanced data between the respondents who agreed and who disagreed about the comfort of the reflection of sunlight coming into the room, mostly Respondents feel comfortable with artificial and natural lighting in the computing lab, natural lighting is not sufficient space when not using the lights, respondents feel the artificial lighting in the computing lab was bright, lighting in the computing lab did not make the eyes glare and tired quickly, the shadows In the field of work does not interfere when reading and using computer, the furniture on the room is not arranged neatly, the color on the room is appropriate, the room width is not appropriate, and the lighting in the room affect the concentration when reading and using computer.

a. Observasion result

The authors make light measurements at points that have been determined above the

work plane. Measurements are done separately in the lecturer's room and laboratory room, both spaces are located in the computer laboratory. Measurements were made on the same day with 3 different times ie morning, noon, and afternoon. The measurement of this light simulation is also done when the light goes out (natural lighting) and the light is on (artificial lighting). Here are the results of light simulation measurements:

- *Lighting level of lecturer workspace at 09.00 WIB*

Table 4.1 Lighting level of lecturer workspace at 09.00 WIB

Lights point	Articial light (lux)	Natural light (lux)
1	225	95
2	227	82
3	230	87
Average	227.3	88

- *Lighting level of lecturer workspace at 12.00 WIB*

Table 4.2 Lighting level of lecturer workspace at 12.00 WIB

Lights point	Articial light (lux)	Natural light (lux)
1	218	102
2	255	115
3	247	118
Average	312.67	111.67

- *Lighting level of lecturer workspace at 12.00 WIB*

Table 4.3 Lighting level of lecturer workspace at 15.00 WIB

Lights point	Articial light (lux)	Natural light (lux)
1	188	80
2	202	74
3	206	69
Average	198.67	74.3

Then the authors do the measurement of lighting in the room at the points that have been determined above the work plane.

- *Lighting level of laboratory room at 09.00 WIB*

Table 4.4 Lighting level of laboratory room at 09.00 WIB

Lights point	Articial light (lux)	Natural light (lux)
A1	291	87
A2	278	79
A3	173	29
A4	110	18
B1	293	79
B2	278	60
B3	192	32
B4	137	20
C1	284	65
C2	289	50
C3	227	32
C4	170	22
D1	286	58
D2	291	46
D3	225	33
D4	237	28
E1	284	57
E2	306	44
E3	270	40
E4	241	26
F1	285	67
F2	283	45
F3	232	32
F4	183	20
G1	290	98
G2	276	60
G3	219	34
G4	175	17
H1	334	193
H2	269	91
H3	183	27
H4	142	16
I1	596	468
I2	265	130
I3	147	22
I4	106	15
Average	245.75	62.2

- *Lighting level of laboratory room at 12.00 WIB*

Table 4.5 Lighting level of laboratory room at 12.00 WIB

Lights point	Articial light (lux)	Natural light (lux)
A1	326	130
A2	281	96

A3	160	24
A4	135	20
B1	309	100
B2	277	65
B3	176	35
B4	139	19
C1	289	76
C2	285	58
C3	224	39
C4	162	18
D1	281	65
D2	271	39
D3	229	35
D4	240	28
E1	293	66
E2	292	58
E3	279	42
E4	239	26
F1	265	65
F2	258	48
F3	233	33
F4	180	22
G1	269	87
G2	270	61
G3	201	32
G4	173	18
H1	305	161
H2	274	88
H3	187	30
H4	130	15
I1	465	350
I2	290	133
I3	142	22
I4	105	14
Average	239.83	62.2

- *Lighting level of laboratory room at 15.00 WIB*

Table 4.6 Lighting level of laboratory room at 15.00 WIB

Lights point	Articial light (lux)	Natural light (lux)
A1	273	97
A2	253	76
A3	159	25
A4	109	16
B1	255	73
B2	253	54
B3	180	28
B4	153	18
C1	253	55

C2	267	47
C3	216	33
C4	172	20
D1	250	49
D2	261	39
D3	227	32
D4	229	26
E1	250	48
E2	285	50
E3	281	38
E4	238	21
F1	245	54
F2	268	43
F3	225	34
F4	181	21
G1	235	75
G2	260	64
G3	219	37
G4	163	16
H1	283	137
H2	275	108
H3	195	34
H4	145	12
I1	551	350
I2	335	224
I3	142	23
I4	110	12
Average	233.2	58.0278

5. CONCLUSION

Based on the results of the research it can be concluded that Room 306 is not in accordance with the provisions of laboratory space lighting according to the SNI of 350 lux for computer room and the lecturer room. However, the opening position is in accordance with the standard that is on the south and north side of the building. But due to uneven width openings on each north and south side of the building so there is a side of the room that does not get natural light that makes the lighting is not optimal and the room looks dark. Openings are at varying altitudes and obstructed by the jalousie, there is furnitures that blocks direct reflection of light toward the work area, the condition of the room tends to be less clean and tidy, and the distance laying between the furniture is too close that makes a narrow impression.

Preferably the opening of the light on the north side wall is widened and added

aperture on the south of partition wall side so that it can cover the back of the room.

REFERENCES

- [1] Prasasto, Satwiko.2004. *Building Physics I*.Yogyakarta: Andi.
- [2] SNI. Indonesian National Standard, 2003. *Procedure of Designing Artificial Lighting System in Building*. 63-6575-2003.
- [3] DKI Jakarta Government, 2012. *Sistem Pencahayaan*. Jakarta: *User Guide Jakarta Green Building Building Under Governor Regulation*. No. 38/2012 Vol. 3 P. 21.
- [4] SNI. Indonesian National Standard, 2003. *The Procedure of Designing Natural Lighting System in Buildings*. 03-2396-2001.
- [5] SNI. Indonesian National Standard, 2003. *Energy Conservation of Lighting System*. 03-6197-2000.
- [6] Gordon, Gary and James L. Nuckolls.*Interior Lighting for Designers* (New York: John Wiley & Sons, Inc, 1995), hal 43
- [7] Frick, Heinz, et al. *Science of Building Physics*. (Yogyakarta: Kanisius,2008) hal22
- [8] SNI. Indonesian National Standard, 2011. *Energy Conservation of Building Envelopes in Buildings*. 6389-2011)

The Application of Current Multimedia Technology In The Showroom Space

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Abstract — Showroom as a mean to show off objects would require interior treatment in order to attract the attention of the target audience. Various treatments can be done include lighting treatment, layout arrangement, decorative elements, and use of interactive displays. In this research, the design of the exhibition space of electricity education museum in Jepara becomes a case study for the latest multimedia applications. The interior design of the museum of electrical education aims to create the museum's interior as a means of education and recreation, so visitors can absorb information without feeling bored. With the Human Centered Design approach, the design focuses on various factors that affect human as user in their interaction with objects on display. One way to create a fun atmosphere is to build a more dynamic interaction between visitors with show objects. By using the latest technology such as virtual reality and augmented reality, it is feasible to create objects that show not only stand individually, but also able to create interaction with visitors.

Keywords – *Show room, Educationi, Electricity*

1. INTRODUCTION

Nowadays, technology advancement impacts the change of human lifestyle and interaction with objects. People are currently interconnected, as the development of virtual reality and augmented reality continues to blend real world experiences with virtual world experiences. The development of these technologies provides an opportunity to explore the potential of its application to various objects of showroom. This research focuses on the application of the technology in the exhibition space of electricity education museum in Jepara.

Museum is an informal learning place, where visitors can learn and understand a lot of information in one place independently. Similar to classroom learning, museum visitors learn by watching, observing, and exploring new things. The learning process is enhanced by various displays' presentation of objects. Display as a medium of information delivery within the

museum plays an important, participative approach, where users can interact with object on display that would enrich users' visiting experience.

According to Kristianto, et al. (2016), interior design is very concerned with the flow or circulation of visitors. In the context of museum design, the circulation is not only related to the ergonomics of the circulation of visitors but also includes the chronology of information. Based on research that has been done, 68.8% of 138 respondents read the various informations presented at the museum, and they reckon it is important to deliver a story line chronologically. Respondents visit the museum to widen their insight and as a refreshing means, therefore the entertainment parts within the museum should be given a sufficient portion.

Electricity plays a vital tool that supports the development of technology in various aspects. Therefore, electrical education is closely related to the latest technological developments. In the

context of museum design as a means of education and recreation, we should include the role of technology in delivering information as a medium of communication to visitors. Some examples of technology that is widely applied is virtual reality and augmented reality. In scientific journals related to computers and education, Wu (2012) cites several expert statements, among them is Arvanitis et al. (2007), they infer that augmented reality can enrich the learning experience with the help of three dimensional imaginary objects that can interact with visitors. Wu also quotes from Chen et al. (2001), that augmented reality technology makes it possible to add visitors' cognitive experience from different perspectives to enrich their understanding.

Limitation

The limit in the design process is the time of each visit which is limited to 60 minutes. That rule was made by the museum management. This journal only examines the design aspects of the museum exhibition area located on the second floor.

2. LITERATURE STUDY

In a study conducted by Jinsil (2017) in which he created a virtual reality anatomy builder where users can assemble a virtual dog's hip bone in an anti gravity field. Results from research conducted by Jinsil (2017), participants using virtual reality take longer period to study than conventional learning, and 90.9% of participants showed a very positive response to the use of virtual reality as a medium of learning. In a study of children's experiences visited the museum carried out by Piscitelli (2007), he suggested that the museum provides a link or context between the exhibits with the daily activities of children.

Hood in Sheng (2012), identified six criteria of recreational experience that people desire: (1) there is social interaction present; (2) doing something useful; (3) feeling of comfort in an environment; (4) getting challenges to do something new; (5) having opportunity to learn; (6) are actively involved. The application of multimedia technology can certainly be a supporter of the opinion conveyed by Hood (2012), to create interaction among users and objects.

3. METHODS

The design process of the museum show room is explained through the following figure:

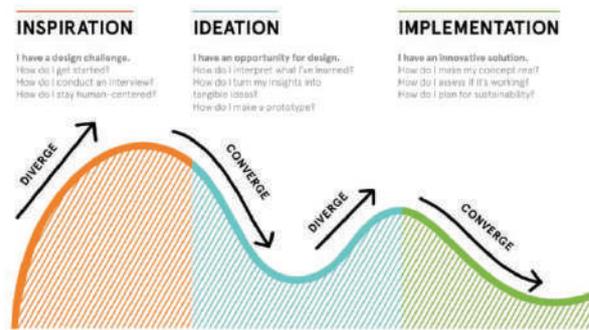


Figure 1. Human Centered Design method
 Source: *Change by Design*. Tim Brown

The design method refers to the Human Centered Design method developed by Tim Brown in his book, *Change by Design*, 2009. At the inspiration stage, we identify problems and opportunities, at ideation stage our ideas are generated, and at implementation stage we implement the design and tested it on stakeholders. The design process is complemented by literature study, questionnaire, and comparative studies with various museums with similar concept.

4. RESULTS

Questionnaire Results

Some important findings of the questionnaire results are; structuring objects chronologically allows visitors to understand the contents of the museum as a whole; the need of recreational means using attractive display; And the addition of interior decoration elements to make it attractive to take pictures. The use of augmented reality and virtual reality technologies is capable of providing a fresh experience to museum visitors. And the use of the latest technology is in line with the concept of electricity education museum that is very close to the development of today's technology.

Table 1. Questionnaire results

No.	Question	Answer
1.	How often do you visit museum in a year?	70.3% respondents visit museum once or fewer in a year, and the rest visits twice or more in a year.
2.	How is your experience with the museums that you have visited?	38.4% of respondents felt that the existing museum in Indonesia was less attractive and needed to be improved, the vast majority gave a positive response.

3.	How much do you read information provided by museums on exhibited objects?	68.8% respondents answer that they read most of information provided by the museum.
4.	What can the management or designer do to not make visitors bored? Explain your opinion	52% of the respondents feel that the museum needs clear storyline so the delivery of information is chronologically coherent. The use of modern technology in making interactive display of museum can be a refreshing experience to visitors.
5.	What is your expectation the next time you were to visit a museum?	In the adding of insight process, they hope that they will not be bored anymore the next time they were to visit a museum. Not few of them hope that the museums they have visited to have attractive design so as to make better photo background.

Comparison Study

Museum Bank Indonesia, Jakarta

In the Bank Indonesia Museum Jakarta, the presentation of the material is very good, by using spotlight lighting on each exhibition object so as to focus on the area. There are multimedia displays that play videos related to the content of the material in the area, but there is still no interaction present between users with objects on display at the museum. The advantage of the Museum Bank Indonesia is its ability to build the atmosphere around the objects that are on display so that this becomes a plus value for visitors.



Figure 2. Interior of Bank Indonesia Museum

Museum Nasional, Jakarta

This museum contains a lot of valuable collections of the Indonesia, such as inscriptions, miniature of traditional house, and jewelry. Situated in areas that incorporate a large amount of natural light, the spot light helps to emphasize the objects that are highlighted, but overall this room looks too bright, therefore reducing the focus on each object. The use of multimedia in this museum would be very useful, considering the content of this museum is an object that contains rich history of the Indonesian nation. By adopting augmented reality or virtual reality technology, museum management can present a variety of additional information related objects on display.

Figure 3. Interior of National Museum



Museum of Electricity and New Energy (MLEB), Jakarta

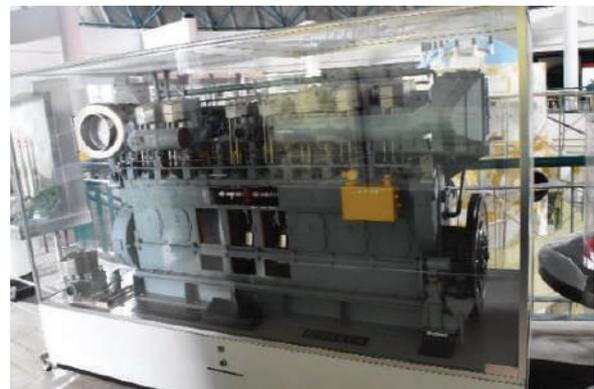


Figure 4. Interior of Museum of Electricity and New Energy, Jakarta

MLEB has many showpieces in the form of power plant components, but unfortunately, the description of every object is only briefly explained because it is just in the form of text. It would be better if the objects exhibited to be accompanied by a video explanation on how it works so that users get a

coherent picture. MLEB also uses various media to convey information, including infographics, power plant miniature, props, and real components. This museum has not used a lot of touch technology, such as the use of animation or audio visual.

Design Results

Implementing the HCD (Human Centered Design) method, the design of this museum aims to educate and also become a recreational place for everyone who visits. By focusing on user experience, there are several key concern during the design process, that is:

Circulation

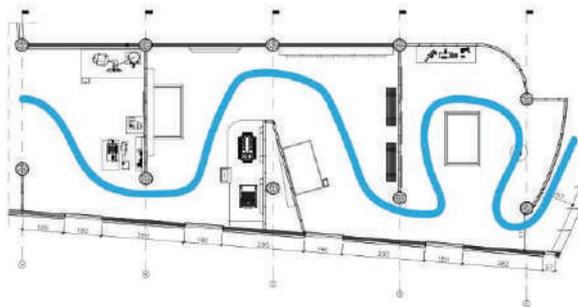


Figure 5. Circulation planning in exhibition area

To maximize visitor experience, the arrangement of showpieces is designed is based on the information it contains, by using a solid blocking technique that makes visitor focused on a specific object. With a linear circulation flow, visitors will automatically enjoy the exhibits one by one continuously.



Figure 6. 3D perspective exhibition area

Every objects are placed with the concern of the anthropometry of human body, ranging from children to adults. The width of the hall way is not less than 200 cm, which is larger than the adult horizontal circulation standard 172 cm circulation space stated in the human dimension and space written by Panero (1979). Circulation direction is optimized by wayfinding in the form of vinyl stickers on the floor that will lead visitors through every object in the museum.

Lighting

To give a dramatic impression and focus on objects displayed, lighting in the museum is designed in a dim style. Lighting comes only from the spotlight that highlights on each object as well as the display area. This type of lighting is considered capable to direct the focus of visitors to pay attention to the objects that are highlighted. The use of tracks on the spot lights makes it easy to adjust if a museum is renovating and rearranging.



Figure 7. Lighting in interior with spot light

Displaying objects

The various types of media used to present the material are crucial in the design of the museum. In the design of this museum, each object is presented in different ways, not only in the display of information delivery but also how visitors interact with objects.

Beauty aspect is the main focus in shaping the display design, the objects are designed to be a photogenic spot for museum visitors. This idea arose through the questionnaires result that has been made, which in fact many people visit the museum not only for educational purpose but also for taking pictures.



Figure 8. Display and photogenic spot for all ages visitor



Figure 9. Virtual reality in the museum

Electricity plays an important role as a genesis of many innovations in the modern world, this museum is designed with the same mindset to inspire people to the innovations that exist. In the design of this museum, Virtual Reality (VR) is created so that visitors can feel the simulation of a transmission worker. The purpose of the simulation is to help visitor understand the electricity distribution process. Simulation using virtual reality is able to provide enough information solid without the need to spend a lot of time to read.



Figure 10. Scale model with augmented reality technology

Augmented reality in the design of this museum only applied to the PLTU scale model, the goal is to provide additional interactive information to the visitor. With a model of 80 cm tall, visitors can easily operate augmented reality.

5. CONCLUSION

Designing a museum requires much focus on the use of display types, this is important because it will be closely related to the visitor experience on visiting the museum. Blocking and object settings must be larger than the horizontal human ergonomic standards, due to the various number of visitors to the museum.

The use of the latest information delivery techniques, such as augmented reality and virtual reality can be presented in a compact form.

Because the design of this museum has a visit limit of only 60 minutes per visit, then the need for further studies related to the effectiveness of the use of digital devices used, such as augmented reality and virtual reality.

6. ACKNOWLEDGEMENT

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REFERENCES

- Chen, Yi-Chen, et al. (2011) Use of tangible and augmented reality models in engineering graphics courses. *Journal of Professional Issues in Engineering Education & Practice* 137.4: 267-276.
- Seo, Jinsil Hwaryoung, et al. (2017). Anatomy builder VR: Applying a constructive learning method in the virtual reality canine skeletal system. *Virtual Reality (VR), 2017 IEEE*. IEEE.
- Arvanitis, Theodoros N., et al. (2009) Human factors and qualitative pedagogical evaluation of a mobile augmented reality system for science education used by learners with physical disabilities. *Personal and ubiquitous computing* 13.3: 243-250.
- Wu, Hsin-Kai, et al. (2013) "Current status, opportunities and challenges of augmented reality

in education." *Computers & Education* 62: 41-49.

Kristianto, T.A., dan Budianto C.A. (2016) Representasi Desain Indisch Trophic Dalam Desain Interior Museum Pendidikan Dokter Indonesia di Surabaya. *Laboratorium Sains Interior Departemen Desain Interior ITS*.

Sheng, C. W., & Chen, M. C. (2012). A study of experience expectations of museum visitors. *Tourism management*, 33.1, 53-60.

Piscitelli, B., and Anderson, D. (2013). Young children's perspectives of museum settings and experiences. *Museum Management and Curatorship*, 19(3), 269-282.

Brown, Tim. (2009). *Change by design*. New York: HarperCollins

Prototype of Decoupage Image with Indonesia Theme to Support Indonesian Branding and the Craft Industry

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ABSTRACT - Decoupage is a method to make image to a product (with any variations in form, material or size) by cutting and gluing a pictured tissue to a product. Image in tissue can be made by hand drawing or digital imaging. By the digital imaging method, decoupage product can be systematically produced in big volume in more precise and efficient. Decoupage image can be applied in a thin paper, such as: napkin tissue, rice paper and others. Decoupage paper can be applied in many kinds of material, such as wood, bamboo, glass, ceramic, fabric, and others. Because of its thin, decoupage paper can follow many kinds of surface type, shape and size. According to that, decoupage can be applied to many products, such as: bag, clock, furniture, box, poster, keyholder, to increase aesthetic value and function. A problem of decoupage craft in Indonesia is there is lack of design with Indonesian theme. Existing decoupage papers in the market are imported product with have been filled by international image themes. On the other hand, Indonesia is rich with unique themes, such as: architecture objects, endemic flora and fauna, arts and culture. Indonesia is rich with potential small industries especially in craft product, such as: bag, home décor, wood, bamboo, and others. This research aims to: 1) define Indonesia potential object that interesting to consumer; 2) make concept and design or drawing style that interesting to the consumer; 3) make concept and design that fit between decoupage image and product as decoupage media; 4) make experiment of printing process on decoupage paper. The research outputs are: 1) decoupage paper with Indonesian theme: architecture, portrait, flora, fauna and art and culture; 2) decoupage product with Indonesian theme: wall clock, clutch bag, tote bag, boxes and furniture. The Indonesian decoupage product can be a potential values to contribute in Indonesia branding program. The Indonesia decoupage design can be a solution to these problems that can support small industries to apply decoupage product with Indonesian theme and to increase creativity of small industries especially in craft and home décor product.

Keywords: *decoupage paper, decoupage product, Indonesia object theme, small industry.*

INTRODUCTION

Decoupage is a method to make image to a product (with any variations in form, material or size) by cutting and gluing a pictured tissue to a product. Image in tissue can be made by hand drawing or digital imaging. By the digital imaging method, decoupage product can be systematically produced in big volume in more precise and efficient. Decoupage image can be applied in a thin paper, such as: napkin tissue, rice paper and others. Decoupage paper can be applied in many kinds of material, such as wood, bamboo, glass, ceramic, fabric, and others. Because of its thin, decoupage paper can follow many kinds of surface

type, shape and size. According to that, decoupage can be applied to many products, such as: bag, clock, furniture, box, poster, keyholder, to increase aesthetic value and function. A problem of decoupage craft in Indonesia is there is lack of design with Indonesian theme. Existing decoupage papers in the market are imported product with have been filled by international image themes. On the other hand, Indonesia is rich with unique themes, such as: architecture objects, endemic flora and fauna, arts and culture. Indonesia is rich with potential small industries especially in craft product, such as: bag, home décor, wood, bamboo, and others.

The Indonesian decoupage product can be a potential values to contribute in Indonesia branding program. The Indonesia decoupage design can be a solution to these problems that can support small industries to apply decoupage product with Indonesian theme and to increase creativitfy of small industries especially in craft and home décor product.

RESEARCH FOCUS

This research focuses:

1. to develop concept and design of decoupage paper with Indonesian themes that has potential values for customer and branding, i.e.: architecture icon or landmark, endemic flora, endemic fauna and arts and culture.
2. to develop the prototype of decoupage paper.
3. to develop the prototype of decoupage product that can be taken by customes as handy souvenir.
4. to develop the production process of decoupage product, i.e.: concept, design and drawing, imaging process digitally, printing decoupage paper and decoupage process to product. The product that has been objects are: wall clock, clutch bag, tote bag, box, sign board and keyholder.

Benefits of this research are that:

1. can upscale craft product of small industies by adding aesthetic aspect from Indonesian content.
2. can improve Indonesian branding by designate its potencies such as: architecture, endemic flora and fauna, atrs and culture to global market.
3. can develop unique product that invloves both digital technology and craftsmanship that results pecision product with medium volume production but still has handcraft character.

DECOUPAGE TECHNOLOGY

Decoupage (Manning, 1980), from word “découper” (France) has a meaning “cut out”, is a drawing method to many kinds of product and material by transferring image through a thin paper. The image that pasted on product impresses unity between decoupage image and the product. Pasting process uses PVA glue. Finishing process applied with clear coating or varnish after the glue dries up. Advantages of decoupage technology are:

1. can be applied to almost all material, such as: wood, metal, bamboo, glass, ceramic, plastic/polymer, fabric and leather with many kinds of surface, color or shape.
2. can be applied easily from pictured paper to product by cutting out and pasting.
3. can be drawing or painting digitally so that allows repeating with precision (advantage in production), developing various drawing styles (oil painting, watercolors, line sketch, or photo realistic) and creating various drawing themes (portrait, architecture, flora, fauna art, culture, or word).
4. Can realize the both method of mass production and craftsmanship.

Decoupage process, pervades:

1. Making design planning and design concept of image and product comprehensively.
2. Making drawing or painting, by digital method is recommended. The drawing object, drawing style, scale, dimension, colors and othe content are the aspects that must be considered creatively.
3. Printing the drawing or painting file to thin paper, such as napkin tissue or rice paper.
4. Preparing tools and materials: product that can be applied, cutter, brush, glue and others.
5. Cutting out the decoupage paper that appropriates to design concept.
6. Brushing the product with glue.
7. Pasting the decoupage paper and pushing glently.
8. Brushing the surface of decoupage paper with glue.
9. Allowings the glue dieres up naturally.
10. Coating the product surface with varnish.
11. Finishing touches is needed depends on the creativity.

METHOD

Design Process, as the first step of this research, pervades:

1. Defining design concept: object as decoupage image and product as decoupage media. Defning object image has been pursued by quistionare techniqne and analized by SAM. The qriteria of this research method based on consumer preferences of the object image, pervades: uniqueness, product practicalibility and drawing style. The result described below:

Table 1. Research criteria of decoupage object

N	Criteria	Rank 1-5
1	Uniqueness	Architecture; art & culture; flora; fauna; people
2	Drawing style	Hand sketch; water color; oil painting; transparant background; line drawing
3	Color	Real color; multi color

The criteria of this esearch method is consumer preferences of types of product, pervades: material, practicalibility and function. The result described below:

Table 2. Research criteria of product

N	Criteria	Rank 1-5
1	Material	Wood; natural fibers; leather; bamboo; new material
2	Practicalibility	Bags; wallet; wall clock; desk clock; boxes
3	Function	Functional product that can be shown to people and medium price

2. Sketching of decoupage object and its product design.
3. Making decoupage image in digital.

Production process of decoupage paper pervades:

1. Adjusting scale and color of image to fit paper.
2. Embedding thin paper to regular paper.
3. Printing the paper

Production process of decoupage product pervades:

1. Preparing the product as media.
2. Preparing materials: PVA glue, brush, cutter, scissors, sand paper and varnish.
3. Brushing the product with PVA glue at the sides to where the image will be applied.
4. Embedding the decoupage paper to the product carefully.
5. After entire decoupage paper has been embedded, brushing with glue again to the image.
6. After the image drying up, softening the surface with sandpaper.
7. Brushing the image with varnish or coating paint.

DISCUSSION

The prototype as the research outputs are pictured decoupage paper and decoupage product that has been applied with decoupage. Prototype of decoupage paper can be illustrated as follows:

Table 3. List of decoupage paper prototype

Category and Theme	Specification
Indonesia architecture	
1. Gedung Merdeka Bandung	Skecth-watercolor, A3
2. Museum BI, Surabaya	Skecth-watercolor, A3
3. Museum BI, Jakarta	Skecth-watercolor, A3
4. Candi Prambanan	Skecth-watercolor, A3
5. Candi Borobudur	Skecth-watercolor, A3
6. Monas	Skecth-watercolor, A3
7. Nuutspaarbank, Surabaya	Skecth-watercolor, A3
8. Gedung Sate, Bandung	Skecth-watercolor, A3
9. Gelora Bung Karno	Skecth-watercolor, A3
10. Masjid Istiqlal	Skecth-watercolor, A3
11. Masjid Raya Baiturrahman	Skecth-watercolor, A3
12. Masjid Raya Medan	Skecth-watercolor, A3
13. Museum Nasional, Jakarta	Skecth-watercolor, A3
14. Jembatan Suramadu	Skecth-watercolor, A3
15. Masjid Raya Sumenep	Skecth-watercolor, A3
People Portrait	
1. Text- Displacement Jokowi	Oil painting, A3
2. Steve Jobs	Oil painting, A3
3. Text- Displacement S. Jobs	Oil painting, A3
4. Peter Gariel (Genesis)	Oil painting, A3
5. Daniel Craig (James Bond)	Oil painting, A3
6. Elon Musk (Tesla)	Oil painting, A3
7. Frank Zappa	Oil painting, A3
8. Sting	Oil painting, A3
9. Pat Metheny	Oil painting, A3
Indonesia Fauna	
1. Rhino	Skecth-watercolor, A3
2. Cendrawasih	Skecth-watercolor, A3

Category of Indonesia Architecture



Fig.1. Gedung Merdeka, Bandung (A3 size)



Fig. 2. Candi Prambanan (A3 Size)



Fig.3. Museum Bank Indonesia, Surabaya (A3 Size)



Fig. 4. Gelora Bung Karno (A3 Size)



Fig.5. Masjid Raya Baiturrahman, Banda Aceh (A3 Size)



Fig.6. Masjid Raya Medan (A3 Size)

Category of Portrait



Fig.7. Portariat dan Text-Portrait Displacement-Jokowi(A3 size)

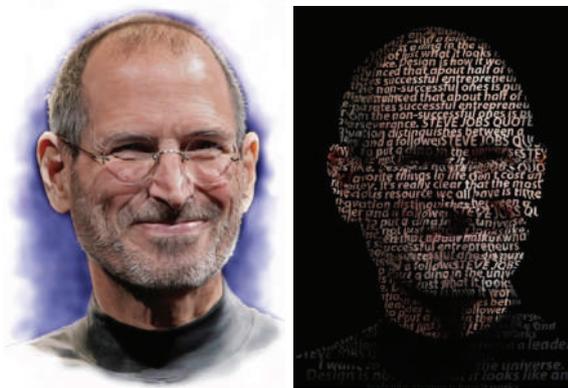


Fig.8. Portrait and Text Displacement-S. Jobs (A3 size)

Category of Endemic Flora and Fauna



Fig.9. Indonesian Rhino and Cendrawasih bird (A3 size)

Prototype of decoupage product that has been applied can be illustrated as follows:

Table 4. List of decoupage product prototype

Category and theme	Specification (cm)
Bag-natural fiber	
1. Tugu Suro dan Boyo	Sketch-watercolors, 25x14
2. Gedung Rektorat ITS	Sketch-watercolors, 20x12
3. Gedung Despro ITS 1	Sketch-watercolors, 20x12
4. Gedung Despro ITS 2	Sketch-watercolors, 20x12
5. Taman Sari, Jogja	Sketch-watercolors, 20x12
6. Tunjungan, Surabaya	Sketch-watercolors, 20x12
7. Pasar Klewer, Solo	Sketch-watercolors, 25x14
8. Masjid Demak	Sketch-watercolors, 40x50
Wall clock	
1. Map of Indonesia	Oil painting, wood, d=25
2. Portrait of Joni H	Oil painting, wood, d=25
3. Portrait of Jokowi	Oil painting, wood, d=25
Keyholder and others	
1. Keyholder-PRS guitar	Photo-montage, 20x10
2. Pencil box-Surabaya	Photo-montage, 25x10
3. Keyholder-Map of Sby.	Photo-montage, 20x10
4. Self Portrait	Photo-montage, 10x7

Bag of natural fiber woven

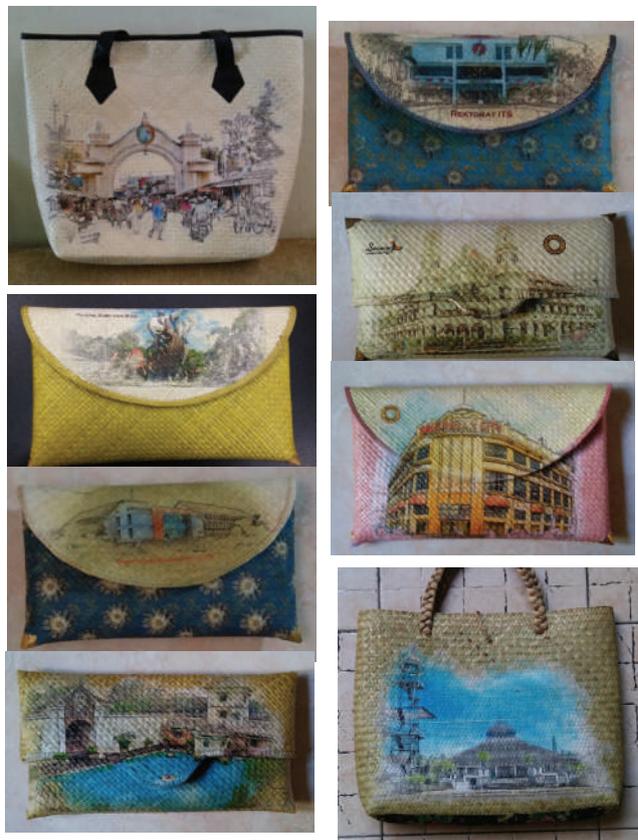


Fig. 10. Bag with theme: Tugu Suro-Boyo; ITS Rector Office, ITS Despro Building, Lawang Sewu, Taman Sari, Tunjungan, Pasar Klewer, Masjid Demak

Wall clock



Fig. 11. Wall clock with theme of Indonesia Map; Portrait of Joni Hermana and Portrait of Jokowi

	<ul style="list-style-type: none"> Nasionalism Peribahasa Lyrics Poems Brief story, history Brief encyclopaia
4	Indonesia endemic flora <ul style="list-style-type: none"> Flower: melati, mawar, kenanga, bakung, kanthil, sepatu, soka, bunga bangkai, etc. Fruit: durian, mangga, manggis, salak, etc. Tree: jati, mahoni, sono keling, rotan, etc.
5	Indonesia endemic fauna <ul style="list-style-type: none"> Mamalia: badak, anoa, harimau, etc. Aves: cendrawasih, perkutut, nuri, bekisar, etc.
6	Map <ul style="list-style-type: none"> Map of Indonesia Map of cities Map of tourism
7	Indonesia food <ul style="list-style-type: none"> Culinary: rendang, gudeg, sate, rawon, soto, etc. Food: klepon, jenang, semar mendem, etc.
8	Art and culture: <ul style="list-style-type: none"> Batik and textile Traditional performance art Music Wayang/puppet Traditional music instrument Traditonal weapon Vehicle

Keyholder and box



Fig. 12. Keyholder with thme of PRS electric guitar and pencil box with theme of Surabaya.

Table 5. Development of concept and design

N	Concept and Design Theme
1	Architecture or landmark of Indonesia <ul style="list-style-type: none"> Sculpture Historic bilding Traditional building Religion building Tourism destination
2	People <ul style="list-style-type: none"> Hero Leader Legend, comic
3	Words, quotes, text

Table 6. Development of drawing style

Drawing Style	Application
1. Architectural sketch	<ul style="list-style-type: none"> Building
2. Oil painting	<ul style="list-style-type: none"> Human portrait
3. Water color	<ul style="list-style-type: none"> Building Human portrait Folra, fauna
4. Text- displacement	<ul style="list-style-type: none"> Human portrait + quotes
5. Comic-style	<ul style="list-style-type: none"> Comic

Table 7. Development of Decoupage Product

Category	Product
1. Bag	<ul style="list-style-type: none"> Clutch Tote Wallet
2. Clock	<ul style="list-style-type: none"> Wall clock Desk clock
3. Wall decor	<ul style="list-style-type: none"> Painting Keyholder Calendar Wall paper
4. Box	<ul style="list-style-type: none"> Pencil box Tissue box
5. Sign system	<ul style="list-style-type: none"> Sign board Map
6. Furniture	<ul style="list-style-type: none"> Chair Table Cabinet

Discussion of the research result pervades five factors: design theme, drawing style, product size, product type and production, that can be described belows.

- The proper design them depends on: unique and original of object (Indonesia), consist of brand image, has an aesthetic value.
- The proper drawing style depends on the object: architecture object fits with color sketcth drawing with outline sketch and watercolor technique; human figure fits with oil painting and realistic drawing; flora and fauna object fits with watercolor sketch.
- The size of product depends of ergonomic aspects: comfortable; practical and appearance.
- The type of product depends on: function, form, popularity of consumer preferences; easily to be shown; relative price.
- By this research, the decoupage paper that can be produced has charaqtteristics of: maximum size: 290 x 420 mm (A3), maximum paper thinness: napkin tissue, color: millions, ink: waterproof.

CONCLUSION

- Idea and output of Indonesia theme decoupage is a unique souvenir that can support Indonesia branding program.
- Decoupage product with Indonesia theme of this research is the first product amongst the other decoupage product.
- The method can be disseminated to small enterprises especially in unique craft products.
- Decoupage product with Indonesia theme has a good prospect in entrepreneurship.
- Decoupage product with Indonesia theme can be produced in small or big volume of production.
- Indonesia theme can be developed infinitely. Development of Indonesia decoupage can be designed by development of concept and design; drawing style; and decoupage product, can be described as follows:

REFERENCE

- Allegro, Monica. 2015. *Suspeso Transparante, Basic Level*.
- Atelier Swarovski. 2011. Trend Design of Jewelry 2012-2013. Accessed: 30 September 2012
- Awal Sholeh. 2010. *Proses dan Metode Pembuatan Master Lilin (Wax Models), Cetakan Karet untuk Perhiasan (Jewelry Rubber Mould) dan Souvenir*. Accessed: 14 Januari 2013
- Barberich, Christene dan Piera Gelardi. 2011. *Five Mainstreams of the 2011-2012 Jewelry Design Trend*, California, Sage Publication, Pvt. Ltd.
- Baroto Tavip, dkk. 2012. *Pemetaan Masalah Desain Produk Perhiasan Perak Khas Indonesia untuk Mendukung Pertumbuhan Industri Kreatif pada UMKM Perhiasan perak Kab. Sidoarjo*, Penelitian Laboratorium ITS 2012, LPPM ITS

- Bishop, Kal. 2004. *Creativity Theory*, Managing Creativity, London.
- Boden, Margaret A. 1994. *Précis of the Creative Mind: Myths and Mechanisms*, Behavioural and Brain Sciences.
- Gala Silver. 2000. *Metode dan Proses Produksi Perhiasan Perak*, akses tgl.: 10 Januari 2013
- De Luca, Paola (2011), *Less is More for the 2011-2012 Jewelry Design Trend*, California, Sage Publication, Pvt. Ltd.
- Denzin, Norman K., Yvonna S. Lincoln (2009), *Handbook of Qualitative Research*, California, Sage Publication, Pvt. Ltd.
- Manning, Hiram. 1980. *Manning on Decoupage*. Dover Publications. ISBN 0-486-24028-2
- Rice, Durwin. 2008. *New Decoupage. Potter Craft*. ISBN 0-307-39611-8
- Snyder, Tina Wojtkiolo. 2011. *Into the Light: the 2012-2013 Jewelry Design Trend*, California, Sage Publication, Pvt. Ltd
- Tzuhui A. Tseng, David Y. Chang, Ching-Cheng Shen. 2009. The Use of Souvenir Purchase as an Important Medium for Sustainable Development in Rural Tourism: The case study in Dahu, Mioli County, Taiwan. Department of Regional Studies in Humanity and Social Sciences, National Hsinchu University of Education, Taiwan. The 2009 National Extension Tourism (NET) Conference
- Yonick, Deborah A. 2011. *2012-2013 as the Innovation Year of the Jewelry Design Trend*, Accessed: 4 Januari 2012
- ZHANG Qi, LIU Hong. 2011. Study on Design and Research of Tourist Souvenirs on the Background of Low-carbon Economy. Energy Procedia 5 (2011) 2416–2420 IACEED2010. www.sciencedirect.com. Accessed: 21 April 2016



**IV.
CREATIVITY
AND LIFESTYLE**

The Styling Process of Indonesian Three-Wheeled Vehicle Design for Comfortable and Safety Factor

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Abstract - Astra Otoparts is a transportation company who focusing on mass production and collaborating with Honda in Indonesia. Japan is known well for the vehicles around the world, one of them is Honda. Seeing that Indonesia is a developing country with a massive population, the Japanese didn't hesitate to make factories in Indonesia to produce and assemble the vehicles produced here. Indeed, Indonesia is the country of category 3, which mean the state of production. However, Indonesia should be able to enter into the country category 1, the state of designing. Indonesia already has sufficient human resources to design a method of transport with the styling idea concept. Astra Otoparts secretly has a vision and mission to design a new styling of vehicle in the mixture of car and motorcycle. So, Astra Otoparts contacted Esa Design Center for collaborating for their designwork. The reason of Astra Otoparts to build this thing was simple, they make a solution how the motorcycle rider no longer got rainy and got the heat by the sun.

Index terms – transportation design, automotive design, vehicle design, industrial design.

1. INTRODUCTION

Astra otoparts, also known as PT Astra Otoparts Tbk, was Indonesia's leading automotive component company that produces and distributes automobile parts for both two-wheeled and four-wheeled vehicles. The history of Astra Otoparts stems from the establishment of PT Alfa Delta Motor in 1976, which operates in the automotive trade, machinery and construction assembly. In 1997 changed to PT Astra Otoparts and in 1998 listed its shares on the Indonesia Stock Exchange, with the transaction code: AUTO. Since then PT Astra Otoparts became a public company under the name PT Astra Otoparts Tbk. Currently the company has transformed into the largest automotive component industry company in Indonesia supported by 7 business units and 45 subsidiaries. While PT Astra Honda Motor is a

company engaged in manufacturing, assembly and distributor of Honda motorcycle brand. And this company is the only one in Indonesia who has the right as the sole agent of the Honda motorcycle holder (ATPM). Established in 1970, under the name Honda Division, Astra Motor used to be the main distributor of Honda motorcycles. Currently, Astra Motor is a main dealer covering eleven regions throughout Indonesia.



Figure 1. Astra Otoparts Company

Indonesia is currently a country of category of production (category 3) within the scope of the transportation industry, where category 1 is category of design, and category 2 is category of design and production (both). Category 1 is usually attached to advanced countries like German, Japan, America, etc. (which creates vehicle design). Category 2 is attached to advanced and well developed countries such as Malaysia and China (which designs the vehicle and produce them in their country). Category 3 is attached to developed countries such as Indonesia, Vietnam, Myanmar, Thailand, etc. (only producing the design creations from other countries idea, following the orders).

Therefore, Astra Otoparts wants to create a vehicle design from their own idea, which means Indonesia has the abilities (manpower) in creating a transportation through the knowledge of industrial design which is not inferior from the advanced countries. To make it happen, Astra Otoparts join the works with Esa Design Center (EDC) for running this project.

Esa Design Center (EDC) is a design center under the auspices of Esa Unggul University which is engaged in industrial design and transportation design. EDC has human resources from academics, professional lecturers, product design students and product designers. EDC works start from concept, analysis, image, 3D to prototype. In this project, Astra Otoparts delivers a unique concept vehicle design, a blend of car and motorcycle, in the form of industrial sketching concept. While EDC makes the 3D design of the concept images provided from Astra Otoparts. Koos Eissen and Roselien Steur (2011:5) mentioned about the collaboration, that the design of a product is a process in which several people work together and contribute to. To keep whole process manageable, these contributions need to be recorded. This is the recorded of design process between the collaboration of Astra Otoparts and Esa Design Center.



Figure 2. Esa Design Center Identity

2. THEORETICAL APPROACH

A. The Meaning of Transportation

Transportation as the basis for economic development and community development as well as growth of industrialization. With the cause of transportation, the division of labor according to the specialization or expertise in accordance with the culture, customs, and culture of a nation or region. Economic growth of a country or a nation depends on the availability of freight in the state or nation concerned. With this we can conclude that the definition of transportation, ie transportation is the activity of moving goods (cargo) and passengers from one place to another place (Salim, 2012).

B. Role of Transportation

Also, Abbas Salim (2012:11) tells the transport has a major influence on the individual, community economic development, and social politics of a country. Transportation is a facility and infrastructure for the country's economic development could push economic growth speed (Rate of Growth).

C. Transportation Planning

Abbas Salim (2012:106) expressed the opinion that the transportation planning is through plan of "transportation system" that is integrated Inter mode Transportation Systems. Planning involves road transport freight and various modes of transport available in urban areas:

- Step-by-step plan of making
Plans were made on the basis of the need for transport services.
- Planning purposes
In the planning must be clear goals and objectives to be achieved for the national or regional interest.
- Objective
Objective means that the objective can be realized in connection with the plans that have been made to implement.
- Survey request
To make the plan should be a survey of the demand for transport services.
- Analysis of demand
After the survey was conducted at the request of the next run demand analysis associated with the required transport

capacity, eventually made traffic forecast using projection (regression line analysis).

- **Solution and Implementation**

Having considered matters relating to transportation networks, cost analysis, the selection of transport modes of social and environmental factors that have made the planning decision to be implemented based on the design that has been prepared beforehand.

D. Industrial Sketching

It start from one point perspective (Bowen et al, 2012) to three point perspective to draw a sketches based on industrial styling. In transportation design sketches, industrial style sketches is very important for the standard transportation designers. It will make a clear way to study and 'read' the pictures from the sketches. Koos Eissen and Roselien Steur (2007:27) mentioned about perspective drawing that the knowledge of basic perspective rules is of course needed to start drawing in perspective. But the same object can be presented in various ways; a sketch can communicate information about the shape of a product as clearly as possible. A sketch can also be used to emphasize an object as being tiny or big and impressive. Besides, sketching is a quick and effective way to visualise large numbers of ideas (Lewin & Borroff, 2010:76).

E. CAD

What is computer-aided design (CAD)? It refers to the process of using computers and specialist software to create virtual three-dimensional models and two-dimensional drawings of products. Various different types of CAD software have been developed for use across a range of applications and industries. By using the computer in conjunction with paper and modelling by hand, product designers are able to develop their ideas more quickly, explore alternatives and, in conjunction with rapid prototyping, create accurate product prototypes (Bryden, 2014). In 3D Aspect, this project uses an Autodesk Alias Automotive. Autodesk Alias Automotive (formerly known as Alias StudioTools) is a family of Computer-Aided Industrial Design (and now called Computer Aided Styling) products starting with Design studio as the entry-level conceptual design system. Tools for sketching, modeling and visualization are combined in one

software package. It meets the specialized needs of designers: sketching, freedom to experiment with shape and form, creating organic shapes, visualization for design review, and data exchange with CAD packages. As the product is used specifically as CAID rather than CAD, its tools and abilities are oriented more towards the 'styling' aspect of design - that is to say, the exterior of the product and the outer appearances. It does not go into mechanical detail to anywhere near the extent that CAD programs such as Inventor, Pro/ENGINEER and SolidWorks do, but has a much more powerful set of tools for the creation of precisely sculpted curves and surfaces. In 3D modeling process, there are five popular ways to represent a model, ie polygonal modeling, NURBS modeling, splines & patches modeling, primitive modeling and sculpt modeling. Autodesk Alias Automotive is the one of splines & patches modeling category. Splines & patches modeling is like NURBS, splines and patches depend on curved lines to define the visible surface. Patches fall somewhere between NURBS and polygons in terms of flexibility and ease of use (Gamal, 2011). Many industrial designers nowadays use 3D as a tool to develop or simply to visualise their projects in a realistic way. The drawing is no longer sufficient for the presentation of a product (Calmettes, 2005:7).

3. CONCEPT IDEA

Astra Otoparts is the party who makes the analysis, concepts and sketches. While the Esa Design Center (EDC) is the party that makes three-dimensional design is responsible in aspects of surfacing and details. Astra Otoparts certainly makes a concept vehicle with their own ideas of thought that are assisted with existing analyzes. The concept is how good to make the motorcycle, but the user like using a car, which means it doesn't got a rainfall and have the air conditioner. Indeed, this concept of vehicle were existed in 10-15 years ago (concept idea), so the project was called 'the concept' as well or it can be called as 'the styling' from Astra Otoparts thoughts and ideas. Lewin and Borroff (2010:74) expressed their opinion that the important things in automotive design is the aesthetic cultivation of every element of an automobile that is visible to a consumer. Historically, the typical

moniker for automotive design was ‘styling’. This is why Astra Otoparts designers emphasize the styling idea from the beginning (means from the first step, ie from concept idea). Motorcycle problems are as follows:

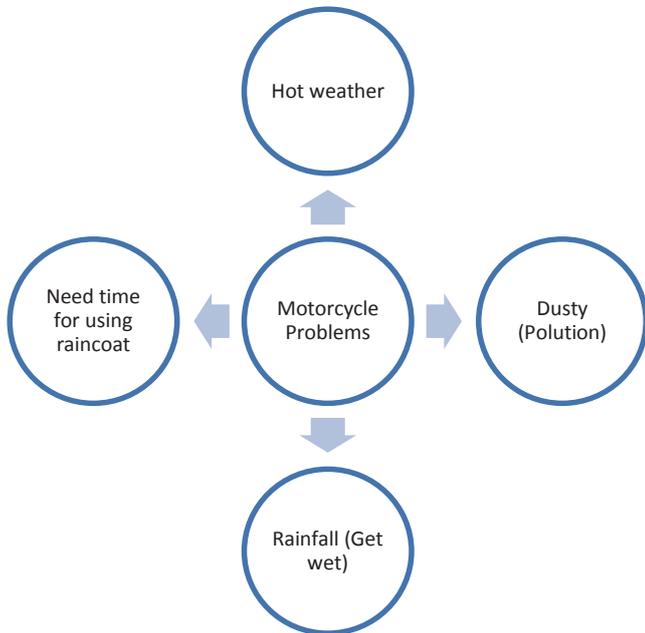


Figure 3. Users problem using motorcycle

And the next is a diagram of Astra otoparts thought that has been mentioned above, i.e. the styling concept of making a motorcycle but like using a car:

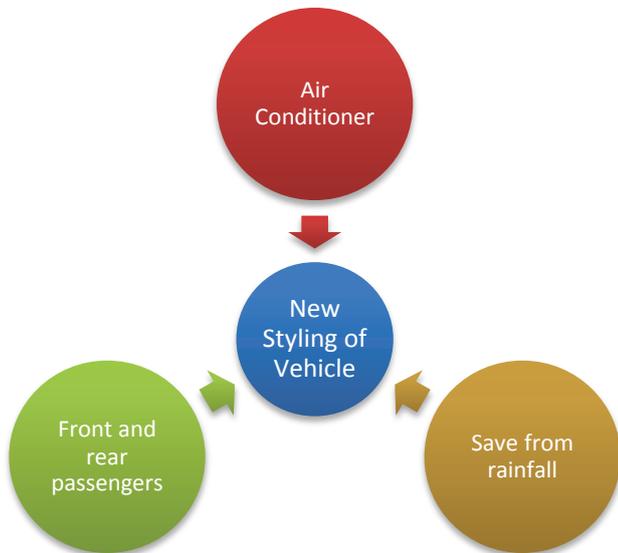


Figure 4. New Styling of Vehicle

The concept of styling are comfortable, safe, protected from the heat of the sun, avoided from pollution dust, avoided from rainfall, and the passenger seat model is front rear mode (like a motorcycle does do). Judging from the idea of the styling, this creation of vehicle will use the chassis between the two-wheeled motorcycle and four-wheeled car, which is three-wheeled vehicle.

4. SKETCH DESIGN

The sketch design process takes about 1 week before the results are submitted to EDC. Astra otoparts parties are responsible for completing the sketch design in detail and clear to be easily applied to 3D Modeling. Sketch design using quick drawing technique, where the images was formed according Astra otoparts concept thought. Sketch design using a black (dry) pen and COPIC marker.

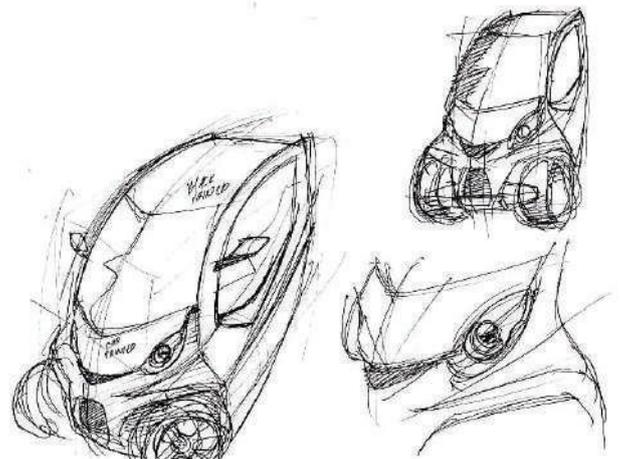


Figure 5. Front Sketches

The picture above is the sketches of characteristics of the concept car. The front face shows more contemporary design, minimalist structure and smart transportation. The front chassis uses 2 wheels and the rear chassis using 1 wheel, with a total in 3 wheels. The position of the grill is at the top and at the bottom. The lower part is more dominant because it is wider and bigger. The position of mirror is placed higher than the current conventional position. Head light design and windows more towards to organic design form, which refers to the shape of the leaf.

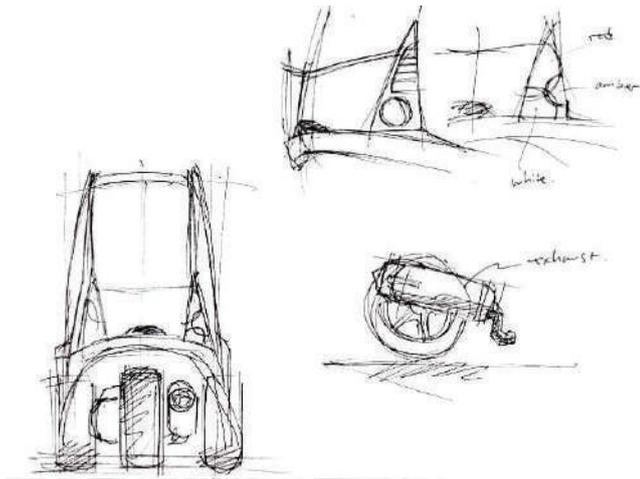


Figure 6. Rear Sketches

At the rear body, it goes shrunk because it is only for one passenger at the backseat. Tail lights has a geometric look, and from the description of the image above, Astra Otoparts designers marks the color of tail light, i.e. red, amber and white. At the rear top center, there is a rear glass for the driver's eyesight. At the bottom of the body there is an exhaust system on the right side of the rear wheels. This exhaust system is the same as the automatic motorcycle in Indonesia. The conclusion at the image above, the rear design is more directed to modern contemporary design.

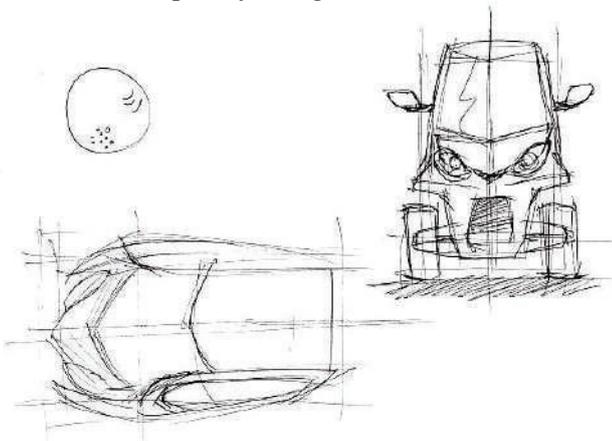


Figure 7. Technical Drawing

This picture (above) shown the top view and the front view. In the top view, its very clear that the shape of the vehicle body has curvy look. And for the front view, it is obvious the vehicle is small and thin because the frontage is for one person. This sketches is much more like a smart transportation (which mean it is an efficient of fuel).

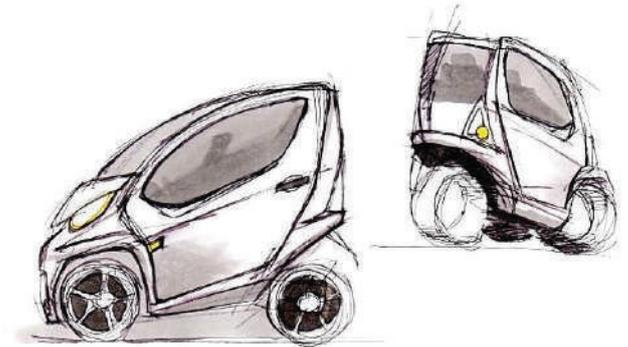


Figure 8. Final sketches design

The final sketches shown manual rendering technique with the side view and 2 point flat perspective. The side view explains the shape of the body, head light, side light, tail light, wheels, door, door handle, doorpost, body line, fenders and seat position (not horizontal line but diagonal line. It is shown from the silhouette). The seat position as mentioned above, the passenger has a higher position than the driver. Which mean the passenger can see what the driver can see. It will help each others for the situation. The 2 point flat perspective explains the overall of body looks and the windows look, and followed by tail lights with the yellow accent. The seat position is shown as well on silhouette.

5. 2D MODELING

Astra Otoparts continue their work before they give the final work. This time they input drawing part into 2D modeling part. The procedure to create this 2D modeling, they scanned their sketches design, and the sketches design must be traced using tools in CorelDraw software. The results has been created below:

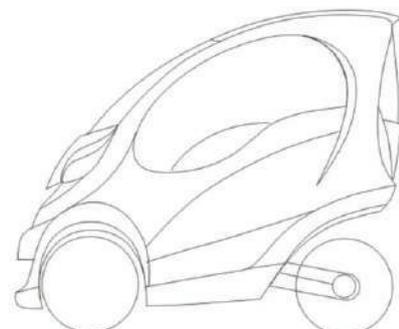


Figure 9. Side view of fixed vector

There is another parts not too identical like the original sketches. If you can see, firstly, the side windows is so different from the sketch, its more curvy at the end of the edge. As well as the middle line of the vehicle's body, head light, tail light, etc. All parts are being curved. Maybe the team designers of Astra Otoparts has a reason why they change the original one become the curved one.

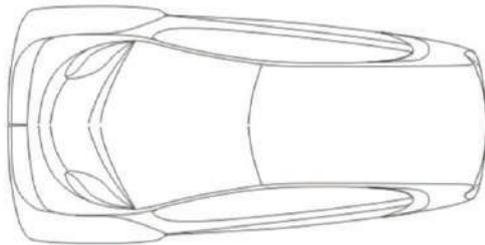


Figure 10. Top view of fixed vector

Also from the top of view, it is more curved body as the figure 9 shown. The rear body is more shrunk because only one passenger available at the backseat.

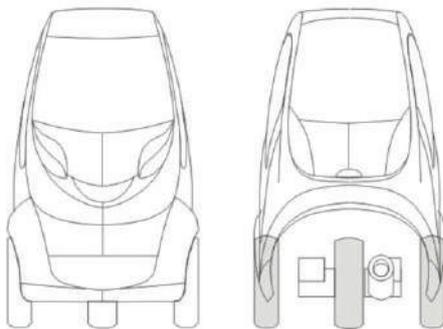


Figure 11. Front and backview of fixed vector

It very obvious the original front sketch and rear sketch is totally different from this one. It seems the interpretation of the sketches and the traces of scanned of the sketches is little bit different, but we can call that an “improvement design”. And finally, they create a perspective of view using 2D modeling technique with digital color. Even the perspective wasn't perfect, but we appreciate them to create a picture below:



Figure 12. Final perspective design with watermark

Astra Otoparts designer want to show us about the whole shape in perspective mode in overall, so we can learn and understand what Astra Otoparts designer thought.

6. CAID/CAS MODELING

This is where the EDC works begun. Astra otoparts finally has finished their part. They gave their final sketch design to EDC to realize their concept idea become a reality concept through computer aided industrial design. Initially, Astra Otoparts wants take this part too, but because of their many activities, they gave us a project to continue their design works.

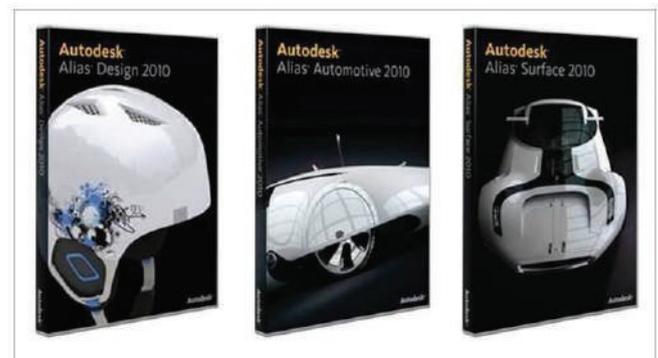


Figure 13. Autodesk Alias 2010

EDC use this softwares because it built for splines and patch modeling. Splines and patch modeling built for transportation, product and industrial design. This softwares, Autodesk Alias, Can also referred to as CAS (Computer Aided Styling). Autodesk Alias come first for the surfacing, thats why it is important to build a perfect surface in 3D Modeling.

EDC take 2 - 3 weeks to create the 3D modeling of this project. It must be clear for the surfacing of this vehicle concept. If there anything wrong, we must did it again even it must be edited in Autodesk Alias (one surface wrong, it'll take 2-3 days to fix the undone surfaces). So we must commit and accurate doing this job. Pictures below is the result of 3D modeling (body only), it takes 2 - 3 weeks to create this fascinating design :

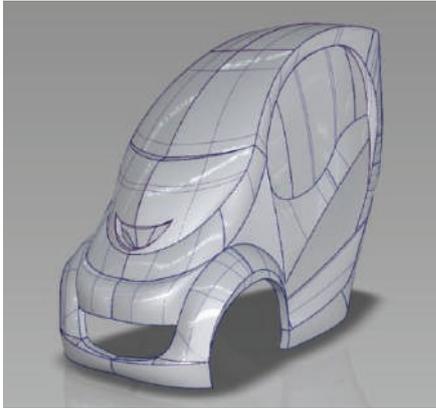


Figure 14. Front perspective (evaluate surfacing)

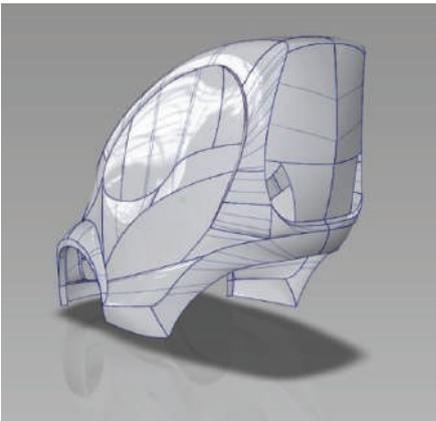


Figure 15. Rear perspective (evaluate surfacing)

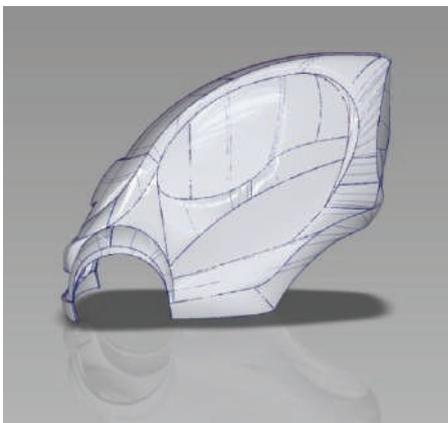


Figure 16. Side Perspective (evaluate surfacing)

Figure 14, 15 and 16 has been made by Autodesk Alias. the 3D was accurately follows the 2D modeling they made. To make sure of this surfacing, we sent the data to Astra Otoparts for revision. They must evaluate the surfacing of the vehicle's body. Between Astra Otoparts and EDC was dealt for 2 revision. If it has a more revision, it will be charged according EDC provision. After a few day, they responded and make an appointment to meet up. The revision has been given back to EDC to fix the problem.

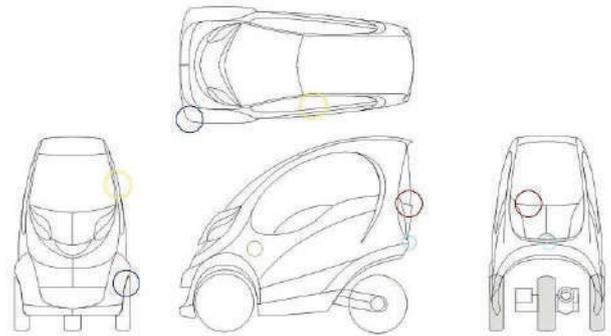


Figure 17. First Revision

There is 5 dots totally to be fixed. Each dots color means is the same spot. The explanation is listed below:

- Yellow dot at window area
- Blue dot at fender area
- Red dot at rear window area
- Green dot at the middle side body
- Cyan dot at low rear body

In other matter, there is a misunderstood about green dot problem, Astra otoparts designer thought it was the wrong surfacing, but the truth is, it is the rendering calculation so the effect of environment reflection was taking a part. It has been proven and Astra Otoparts designer deals it is doesn't need to be edited.

Continue the revision, after 1 week we sent back the first revision and ask about the second revision if there's another incorrect surfacing.



Figure 18. Front details



Figure 19. Overall details

At the pictures above, EDC designers put some details in head lights, body structure, windows, fenders and tail lights. This details includes the material as well. The second revision is not many, it was only detailing in head lights. Astra Otoparts designer wants set the position of yellow lights in head lights, so we continue on.

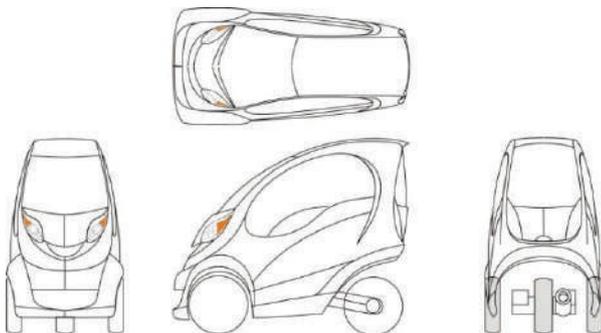


Figure 20. Yellow lights positioning

After a period of time, somehow, Astra Otoparts designer changed his mind, he wants the design back to his original skethes idea. Which means, 2D modeling what he design with a lot of curvy edge, is no longer used. So, it will take the third revision with a lot of modification (changing the head lights, body structures, windows edge, and many more). Of course it will increases the payment of fee of the works because it will takes extended time.

After several times (in week), we made a progress. EDC finished the CAID/CAS back to Astra Otoparts designers original idea (first sketches). The result shown here:

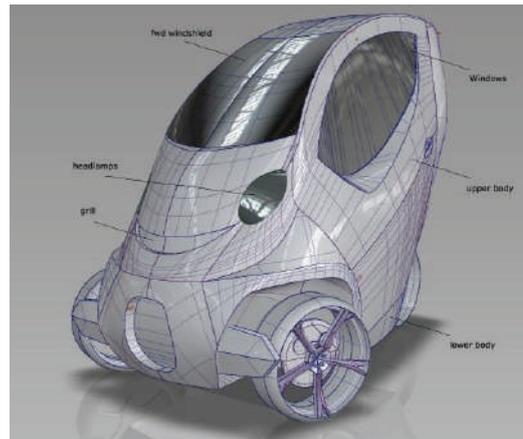


Figure 21. Final Revision in modeling shader (front)

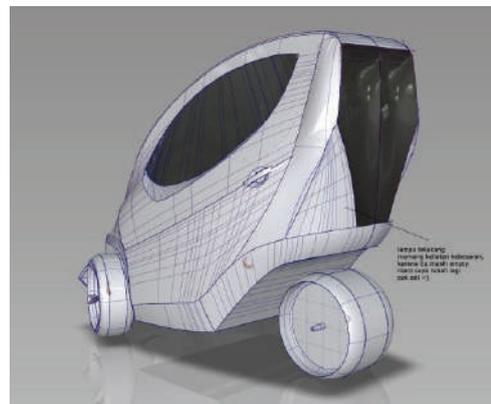


Figure 22. Final Revision in modeling shader (rear)

When Astra Otoparts designers seen this, they all agree of this look and they agree to continue to the next step, ie 3D rendering. 3D rendering step is to input the material, environment (shadow and lights) and drop images.

7. DESIGN RESULT

Realistic rendering are the way to render a thing to be a realistic object, photometric product and become to the real image. Firstly, introduce the keyshot software, which are the powerful of 3D rendering software, 3D realistic photometric and easy rendering software.



KeyShot®

Figure 23. Powerful rendering software

This is the answer of our projects and a standalone rendering software. It can accept all modeling format from 3D modeling software. This is what EDC always use to handle any projects became reality. It took 1-2 days to render this vehicle. The materials, environment (HDRI), and drop image, we must set it perfectly for the better realistic images. After all the result are complete, EDC designers meet up with Astra Otoparts designers once again so we make some appointment in the weekday. The images below is the final work and there is no fourth revision due the deadline. One addition, before this images below, we already gave it to the Astra Otoparts designers but it was sent back due there is one missing object in the images (not rendered) so we must re-rendering again to visible those one missing object, ie side yellow light.



Figure 24. New Transportation Design Creation



Figure 25. Side view of new vehicle creation



Figure 26. Rear view of new vehicle concept



Figure 27. Front look of new transportation concept

We placed a blue material all over the body because we took a color from Astra otoparts symbol, it was a blue in the globe of the logo. And blue has a good reflection if we set a daylight environment (HDRI).

The secondary color we set a white one, its good for the diorama images.

8. DIORAMA

The most of important thing is diorama. Diorama determine the size, measurement and dimension of this new vehicle design creation. So the client will easy to understand and become satisfied. We choose the white color for the diorama because it is a neutral color, good for surrounding reflection (easy way to make a realistic images).



Figure 28. The size and the dimension



Figure 29. Parking lot in Astra Otoparts environment



Figure 30. Parking on the road



Figure 31. On Malaysian road



Figure 32. Park on the small road

9. CONCLUSION

Astra Otoparts gave us a lot of appreciate for finishing this project and they satisfied what Esa Design Center (EDC) deliver to them. They expect for the future projects that Astra Otoparts and Esa Design Center (EDC) has a team. Astra Otoparts gave a name of this new vehicle creation, the name is Caprica Six.

EDC has a hope that Astra Otoparts would produce this vehicle in the near future due it is the Indonesian made. They must show the world that we have an adequate HRD in transportation design sector.

REFERENCES

- [1] Bowen, R., Othman, R., & Aidaliza A. M. J. (2012). *Sketching Basics: One Point Perspective*. Singapore: Page One.
- [2] Bryden, D. (2014). *CAD and Rapid Prototyping for Product Design*. London: Laurence King.
- [3] Calmettes, J. M. (2005). *Best of 3D: Virtual Product Design*. Singapore: Page One.
- [4] Eissen, K., & Steur, R. (2011). *Sketching: The Basics*. Singapore: Page One.
- [5] Eissen, K., & Steur, R. (2007). *Sketching: Drawing Techniques for Product Designers*. Singapore: Page One.
- [6] Gamal, G. (2011). Autodesk Alias Design Software must be More Known for Indonesian Industrial Designer, *Proceedings of Sustainable Design of Creative Industry Towards Better Human Life*. Bali: International Conferences on Creative Industry.
- [7] Gamal, G. (2013). The Opening of Transportation Design Department in Purpose to Advancing the Human Resources and Economic Growth in Indonesia. In Rully A.D., *Proceedings of Empowering Design Quality in Creative Industry Era* (pp. 215-226). Surabaya: International Conferences on Creative Industry.
- [8] Henry, K. (2012). *Drawing for Product Designers*. London: Laurence King.
- [9] Lewin, T., & Borroff, R. (2010). *How to Design Cars Like a Pro*. Minneapolis: MBI Publishing Company.
- [10] Lidwell, W., Holden, K., & Butler, J. (2010). *Universal Principles of Design*. USA: Rockport Publishers.
- [11] Macey, S. (2009). *H-point: Fundamentals of Car Design & packaging*. Pasadena: Design Studio Press.
- [12] Salim, A. (2012). *Manajemen Transportasi*. Jakarta: Rajawali Pers.
- [13] Susantono, B. (2013). *Transportasi dan Investasi: Tantangan dan Perspektif Multidimensi*. Jakarta: PT Kompas Media Nusantara.

Semi Automatic Verticulture Hydroponic Flow System Installation Design

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Abstract — Hydroponic is the method of cultivation of plants using mineral nutrient solution in water and without using media planting land or commonly called soilless culture. Hydroponic enthusiasts are increasing every years, can be seen from hydroponic communities in various cities scattered throughout Indonesia as well as high public interest in the annual routine 'National Hydroponic Gathering'. Required equipment to support hydroponics activity, the existing hydroponic gardening facilities have some problems in their use, including difficulties during tool sterilization, pump service difficulties, and laying on available land. From these problems can be a design opportunity that requires a design that is easy to understand and in accordance with user needs, especially for beginners. Based on the last research about hydroponic by urban user, there are three main design concept especially for beginners: easy grow, simple maintenance, simple control. From the research, there are several design concepts 'Easy Grow' is hydroponic gardening tools that facilitate easy planting by giving additional seedling tray for seeding activity with vertical arranged vertical hydroponic verticulture system, 'Simple Maintenance' design which is to make separate pump installation with the main buffer structure and the detachable reservoir, 'Simple Control' design that facilitates easy monitoring of the system by automatic rotation method, as well as multi-system design that can be used for flow system and static system so it can be used by beginner.

Keywords – *i.e. Urban, Verticulture Hydroponic, easy grow, simple maintenance, easy control*

1. INTRODUCTION

Based on the user's urban user research in the formulation of hydroponic vertikutur design concept of semi-automatic flow system, the concept of 'Easy Grow', 'Simple Maintenance' and 'Simple Control' are found. Easy Grow with gully features or pot module can serve as a means of seeding as well as functioning as a place of growing plants, pot modules have more than one planting hole, multisystem design that can provide education for new users of hydroponics to use a static axis system that can be assembled into a hydroponic verticulture Flow system with more planting capacity. Simple maintenance with reservoir features and pot modules easy to clean post-harvest, canopy feature to reduce UV rays

and exposure to direct sunlight and rain shield, nutrition can be recharged in 7-10 days. Simple control with auto-rotation feature for the plants to get evenly illuminated.

2. METHODS

2.1. Design Alternative

Making some design alternative and solution based on design concept.

2.2. Modeling and prototyping

Making some pod model based on alternative desain

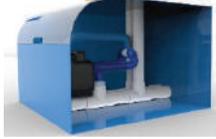
2.3. Usability test

Trying and usability testing the feature then evaluate the result

3. RESULT AND DISCUSSION

A. Design Alternative

Tabel 1. Reservoir and nutrition aliran alternative.

Parameter		
	Alternative 1	Alternative 2
Nutritioning system	Open modul, nutrition can evaporating or contaminated	Using rubber tube. Nutrition cover by tue so that it can't be evaporate
Easy to clean	Easy to clean. Detachable reservoir	Hard to clean. Reservoir as a buffer structure.

Alternative design 1 detachable part is easy to clean. Desain reservoir yang dapat dilepas pasang dan terpisah dari struktur utama lebih mudah dibersihkan. Saluran tertutup menggunakan selang lebih direkomendasikan.

Tabel 2. Sunlight exposure

Parameter		
	Alternative 1	Alternative 2
Sunlighting exposure feature	Light reflector every side in front of the crops	Automatic rotation with timer
Easy to clean	Easy to clean	Easy to clean
Simple maintenance	Maintenance of rotation system	Maintenance of reflector every periode

Lighting feature auto rotation design easier to clean than using light reflection.

Tabel 3. Pod Holder

Parameter		
	Alternative 1	Alternative 2
pod holder feature	Holder use eva rubber as heat isolator	Holder is light weight and it can hold more pod
Easy to clean	Easy to clean	Easy to clean but many parts
Crop quantity	2 pod each holder	4 pod each holder
Strength	Wide and big	Holder using

	holder can bring the pod	5mm steel cilynder
--	--------------------------	--------------------

Pot holder with eva rubber is better because it can absorb heat so that it can be an isolator material to make the temperature stable.

Final Design

Personal Vertical Hydroponic is a tools of gardening vegetable plants for outdoor in residential houses with verticulture hydroponic techniques using flow system DFT (Deep Flow Technique). The concept and features contained in the product are as follows:

Easy Grow: : There are 24 planting holes with 12 removable mini-pot modules that can make users to keep fresh vegetables and ready for harvest in the kitchen. Pot module equipped with seedling tray.

Simple Maintenance: Reservoir with capacity more than 10 liters, nutrients can be refilled in once every 7-10 days. Equipped with a canopy to reduce UV rays and exposure to direct sunlight.

Simple control: There is an automatic rotation feature with motor and timer that automatically set to operate at 8 to 12 a.m. for module rotation in order for evenness in sunlight exposure.



Gambar. 6. Wick System Pod Module Detail



Gambar. 7. Hydroponic Verticulture Design Details

B. Modeling and Prototyping

Prototyping start from material selection, choosing production method of production, finishing, and assembling parts so that product can

be operationalized by the feature.

C. Usability Test

1. Seedling activity



Picture. 10. Seedling Activity

Pod cap can used for seedling activity because it can save some water. Penutup modul pot dapat berfungsi sebagai wadah semai dengan penampung air.

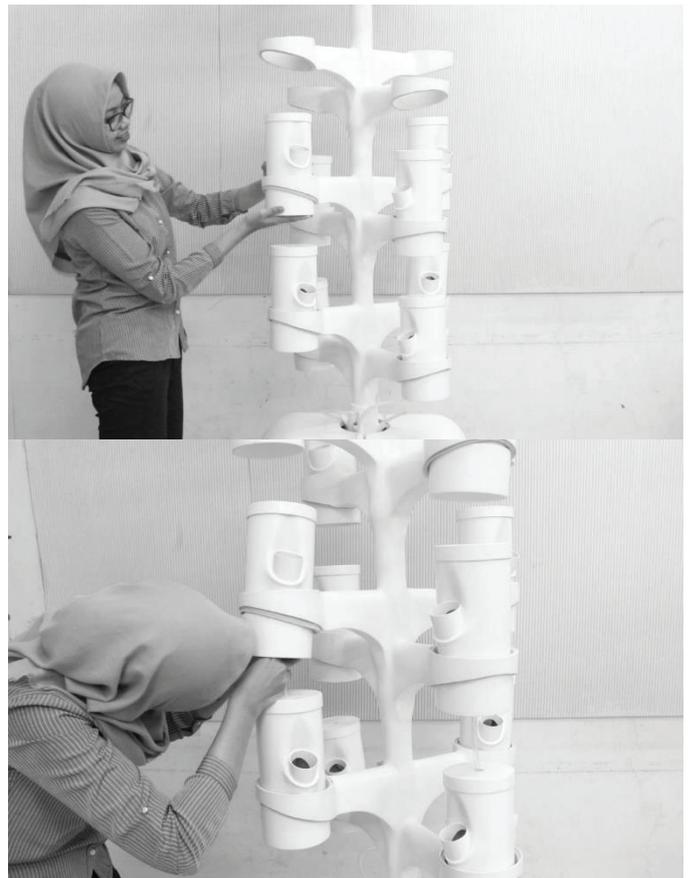
2. Moving plant activity



Picture. 11. Moving Plant Activity

Flannel cloth inserted into the netpot, and filled with seedlings that have grown 4 leaves, then switched to the pot module

3. Installation Activity



Picture. 12. Instalation activity

The main poles and reservoirs that incorporated into one set are too large and heavy. It has difficulty in the initial installation and packing. Installation of pots on the holder takes 2 minutes and hose installation takes 3 minutes. Users have difficulty when installing the hose, they need to look to the bottom of the pot first to be able to see the connection. Pots on the part of the holder is not installed neatly.

4. Nutrition refill activity

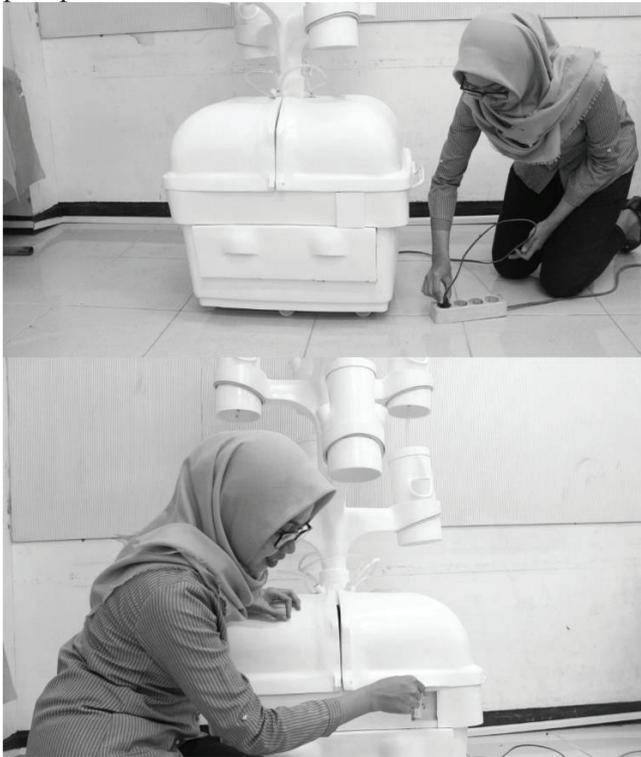


Gambar. 13. Refilling the nutrition

Refilling the nutrition by opening the storage and pouring nutrition on it. Reservoir is too heavy when opened, railing system is not installed properly

5. Running the product

By turning the power on at this product, the auto rotation system and flow of nutrition by water pump can start and can be used.



Picture. 14. Run the product

Plug the cable in to the switch.

4. CONCLUSION

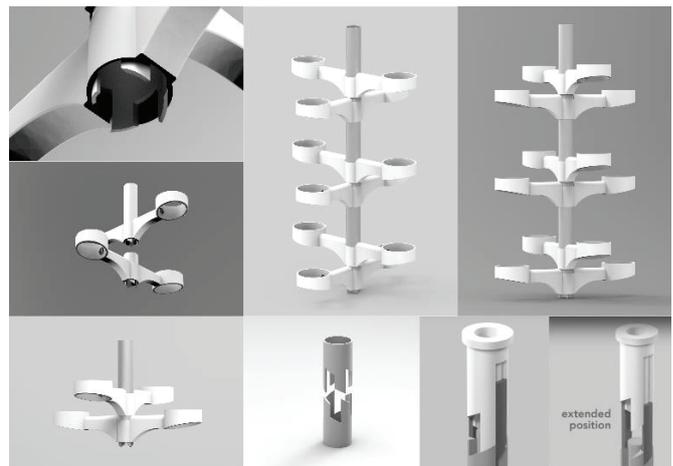
Design can fit the requirement of the basic principles of hydroponics: providing nutrition, illumination, and temperature setting with the following description:

1. Nutrition. Supply of nutrition in the hydroponics module can be refilled once in every 7 days by filling through the reservoir at the bottom of the module. There is a water pump to lead nutrients up. Cleaning the reservoir can be done by taking part of the reservoir alone without moving the entire pot module. In producing the reservoir, a tool is required for easy to assistance.
2. Illumination. Illumination in hydroponic module pot can spread with automatic rotation system using timer to operate at 8-12 a.m.. Rotation system uses motor with 40W/220V electricity.
3. Temperature. Establishing constant temperature on hydroponic pot module by using Eva rubber as isolator on the pot holder. Canopy above the module can reduce the UV radiation and also balance

the temperature. White is chosen as the color for the modul because of its neutral character and heat absorbtion ability. Neutral color also cannot attract the insects.

PROPOSITION: DFT (Deep Flow Technique) flow system which is used can work well with some improvements to be safer and easy to use by users and facilitate the packaging of products. The explanation is as follows:

1. The nutrient hose joint between pot modules is clamped for easy removal and not wet when removed.



Gambar. 15. Sistem sambungan modul holder pot

2. Pot holder joint changed into modular system and with a joint system as picture above, so that it can be packaged succinctly.

BIBLIOGRAPHY

- [1] Roberto, Keth. 2003. *How to Hydroponics fourth Edition*. New York: The Future Garden Press.
- [2] CV ReKayasa Agro Teknologi 2016.
- [3] Martin, Bella & Hanington, Bruce. *Universal Methods of Design*. Beverly: Rockport Publisher.
- [4] Evy, Syariefa. 2014. *My Trubus Hidroponik Praktis*. Depok: PT Trubus Swadaya.
- [5] <http://rizkika.la08.student.ipb.ac.id/2010/06/20/uji-preferensi-warna/>
- [6] Widyawati, N. 2013. *Urban Farming – Gaya Bertani Spesifik Kota*. Yogyakarta: Penerbit ANDI
- [7] Trubus Edisi 547. 2015. *Teknik Terbaru Hidroponik*

Indonesian Pattern for 3D Printing Fashion Development

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Abstract

The use 3D printing technology has expanded into fashion design. The world designers are currently working on developing patterns that possible to be created as 3D printing garment. Indonesia has many unique pattern that can be develop on this technology. This article reports our trial on developing batik kawung pattern by using 3D printing technology and to show the chance of Indonesian pattern into modern fashion.

1. Introduction

3D printed apparel is created by 3D printing with several steps such as create 3D models in software, slice the model into 2D slices, and layer by layer print into a three dimensional products (Perry, 2017). The use of 3d printing for fashion began to flourish since 3D printers were introduced commercially on 2010. Irish van Herpen was the first fashion designer that using 3D prints in 2010. The collection called Crystallization. Since then, the using of 3D printing in fashion has grown in various fashion shows worldwide with various designers (Safiera, 2014). In Indonesia, the using of 3D printing in fashion was initiated

by Tex Saverio. He made his Exoskeleton Collection that consisting 5 dress designs with mixed media between fabric and 3D prints. His work was exhibited at Jakarta Fashion Week 2014 in October 2013.

2. Problem Statement

Indonesia have a variety of traditional textiles that has a thick cultural heritage and contain the value of local wisdom of Indonesia such as batik, tenun, jumputan, sasaringan, sulam, bordir, songket, lurik (Imiraethnique, 2016). On October 2nd 2009, batik was confirmed by UNESCO as a Masterpieces of the Oral and Intangible Heritage of Humanity (Parnomo). Since

then, the used of batik in regular basis increasing, even some agencies require the use of batik for employees on certain day in a week. Beside, the development of batik in fashion design was also growing. Some have even developing batik pattern into a three dimensional form. Such as, the making of three dimensional batik using laser cut on fabric with developing simple application of batik kawung and batik parang by Nayenggita and Drs Yan Yan Sunarya, M.Sn (Nayenggita & Drs. Yan Yan Sunarya). Also, the making of three dimensional impression of batik belanda pattern using screen printing technology to increase the value of printed batik by Tsalashra and Dr Ratna Panggabean, M.Sn (Tsalashra & Dr Ratna Panggabean). But unfortunately, batik pattern worship is still limited to fabric, not yet using other materials. Also, no one has tried to develop batik pattern with 3D printing technology and materials. This motivate the authors to applied 3D printing technology for batik pattern development.

3. Methodology

There are various techniques used to create fashion products with 3D printing. The FDM technique is the most suitable and easiest technique to develop in Indonesia

and also for this research. Because, it can be done on affordable 3D printing machine for small and medium companies or institutions (Lilia Sabantina, 2015). This technique can handle filaments that produced by several materials. But according to the previous research (Anonymous, 2016), the comparison of test result of the filament's ability to produce maximum result with the smallest cost, and easiness to find in Indonesia, there are two filaments that able to use: PLA, and TPU or Flex.

Using predetermined materials, we did some experiments using several form that we got from thingiverse.com that suitable for our research:

Table 3.1. Comparison Between Various Printing Trial of Existing 3D Model Design

File Name	Source	Creator	Type	Material	Print Time	Review
Round Auxetic Surface	Thingiverse.com	Hunter Feerich	One Shot	PLA (Black)	28 Min	+ Detail + Stiff - Fragile - Brittle - Not Stretchable - Not Bendable
Round Auxetic Surface	Thingiverse.com	Hunter Feerich	One Shot	Flex (Yellow)	28 Min	+ Flexible + Bendable + Stretchable - Less Detail - Easy to Tear
Chain Mail Tri-Mesh	Thingiverse.com	Dfyer	One Shot	PLA (Black)	6 Hr 11 Min	+ Flexible + Solid + Movable + Cloth Like - Not Stretchable - Not Bendable
Chain Mail Tri-Mesh	Thingiverse.com	Dfyer	One Shot	PLA (Glow in the Dark Pink)	6 Hr 11 Min	+ Flexible + Solid + Movable + Cloth like - Not Stretchable - Not Bendable
Chain Mail Tri-Mesh	Thingiverse.com	Dfyer	One Shot	PLA (Transp. Red)	6 Hr 11 Min	+ Flexible + Solid + Movable + Cloth Like - Not Stretchable - Not Bendable - Brittle
Hex chain (scale) mail	Thingiverse.com	Jay Jeon	One Shot	PLA (Black)	1 Hr 36 Min	+ Flexible + Solid + Bendable + Cloth Like - Not Stretchable
Hex chain (scale) mail	Thingiverse.com	Jay Jeon	One Shot	Flex (Blue)	1 Hr 36 Min	+ Flexible + Foldable + Cloth Like - Less Detail - Melted Joint - Easy to Tear - Brittle
NASA Chainmail Fabric	Thingiverse.com	Connor Meehan	One Shot	PLA (Black)	6 Hr 25 Min	+ Flexible + Movable + Cloth Like + Detail - Not Stretchable

*certain condition applied: normal printing speed, temperature, Infill 100%, no support

We also did research to determine suitable batik pattern to be developed with the capabilities of our 3D printers, Wanhao D4S. From some references and interviews, batik kawung pattern is the most possible pattern to be modified and developed because it's well known and doesn't have many special rules so it's still possible to modify.

Table 3.2. Comparison between several well known pattern in Indonesia

No	Pattern	+	-
1	Batik Parang	-Pattern well known -Original pattern from Indonesia	-Batik parang has many special rules to followed, so it hard to modify -It can be modified but it will eliminating the values that contain in the pattern

			because when the pattern modified, it becomes new type of pattern
2	Batik Mega Mendung	-Pattern well known -It has a catchy form that easily to remember	-Batik Mega Mendung pattern using color layer, which can't be done by 3D printer.
3.	Batik Kawung	-Pattern well known -Original pattern from Indonesia -Easy to develop and modified -Able to develop with 3D printer's capabilities	
4.	Batik Truntum	-Original pattern from Indonesia	-Pattern less known than the other

		-Easy to develop and modified	pattern
		-Able to develop with 3D printer's capabilities	

4. Experimental

The 3D forms that shown here were designed using Autodesk Fusion 360. The 3D object were exported into Standart Template Library (STL) files and imported in the slicing software to setting up 3D object for printing process.

For the printing process, we use FDM based 3D printer Wanhao Duplicator 4S. The 3D printed additions to garments should be soft, foldable and not too brittle. PLA filament was chosen for this project because this kind of filament was able to fulfill requirement that needed for garment if it build in right structure. The filament diameter was 3.0 mm. The extruder temperature was set to

200°C and the printing bed temperature to 50°C. The layer height was 0.2 mm. It takes 2 hours long in every 169cm² object printed.

5. Result

First, we try to re-create batik kawung pattern on 2D using Corel Draw. We make six patterns of batik kawung, which the two of it are basic shapes of batik kawung pattern. In our first trial, we try to make a 3D print pattern based on the basic shapes.

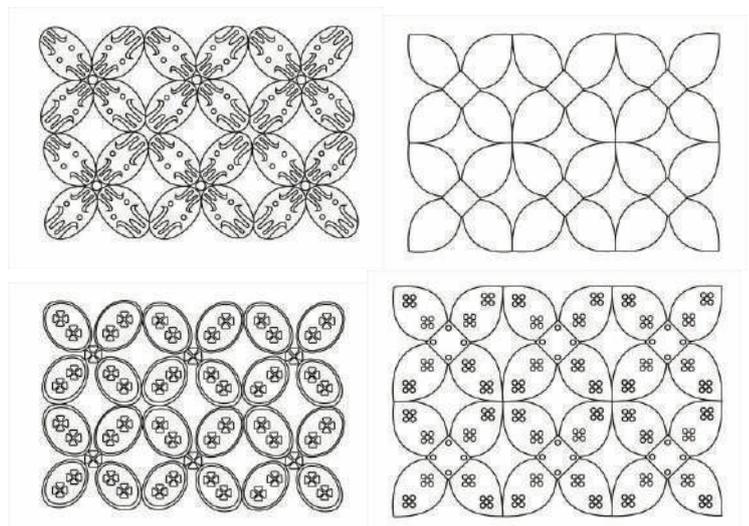


Figure 1. Batik kawung pattern that we re-created.

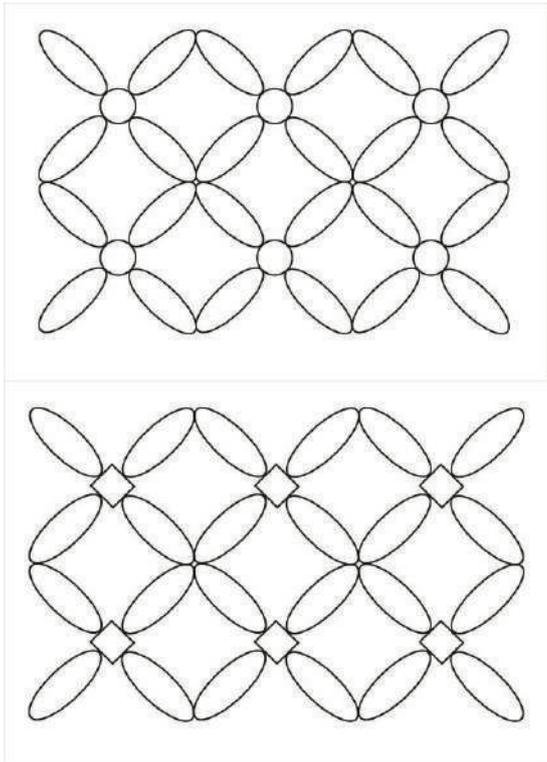


Figure 2. Basic shapes of batik kawung that we try to re-create on 3D print

In the first test, 169cm² with 5 mm height pattern was designed and printed on two different type of joint. The joint was adapted from the previous review, hex chain (scale) chain by Jay Jeon with some modification. This picture below is a 3D model from 3D printed batik first test.

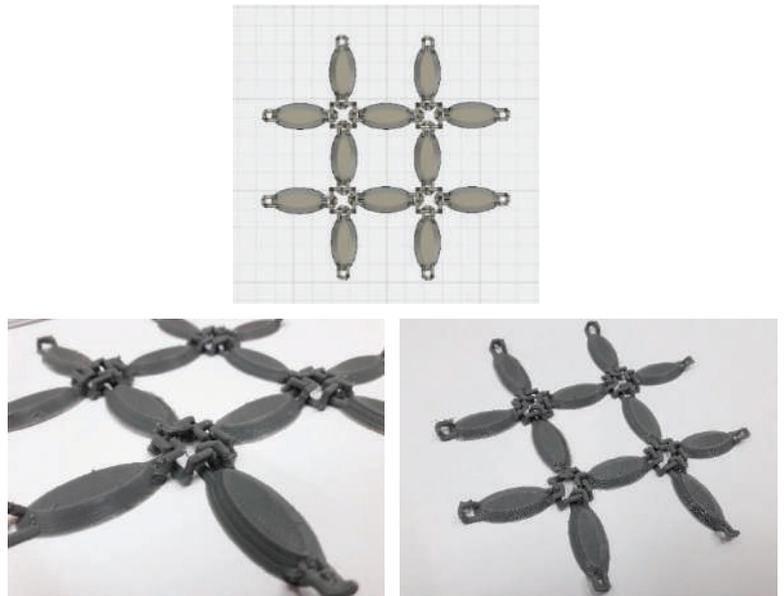
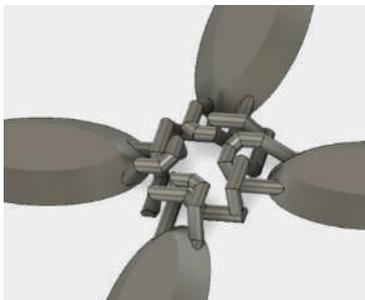


Figure 3. First trial of batik kawung pattern using first type of chainsmail joint

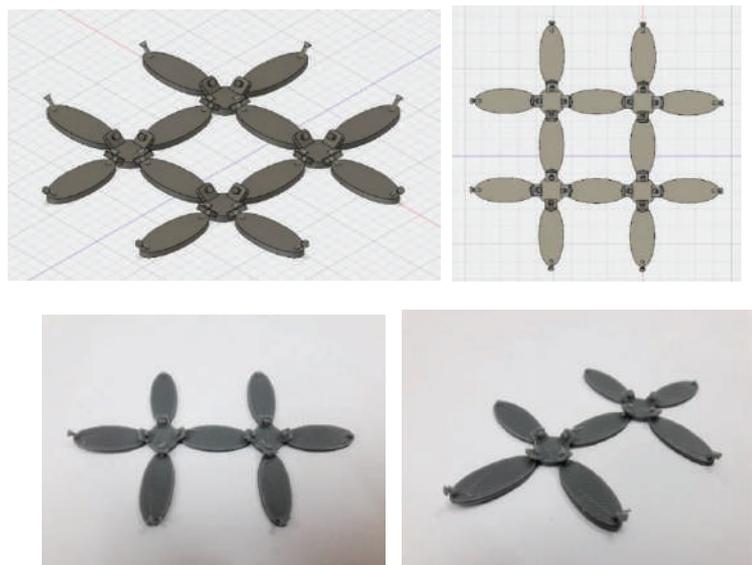


Figure 4. Second trial of batik kawung pattern using second type of chainsmail

Each model has been successfully printed in 2 hours without any support in 13cm x 13 cm. For each printed model can be assembly with other printed pieces. This two trial models has different result. The first one, each module can move freely make 3d printed model becomes more easily to fold. But the joint are too big for this scale, it may distract aesthetic of batik it self. And the second one, the joint is a quite small enough so it could be hidden behind the center of the module. But not like a first one, the second joint harder to fold, makes it hard to adjust with the fashion pattern that will be created late, so it uncomfortable to wear. In order to overcome these problems, next experiment will be focused on how to make right structure of joint. How to build joint which is foldable, small and strong. So this 3D printed batik pattern can be more comfortable and suitable to wear as a fashion item.

6. Conclusion

To make 3D printed object in fashion development needed to following some requirement such as soft so it make comfortable to use, foldable so it surface can follow any body part in any move, strong so it can last longer in any kind of stress. In this case joint is the most important part to make

3D printed object as fashion item. Joint part it can be also as a structure to give the module strenght and flexibility.

Future tests will concentrate on enhancing the adhesion between flexibility and strenght object by using PLA filament.

Referencesd

- Anin. (2013, December 22). *Artikel: Makna Motif Batik Parang*. Retrieved August 13, 2017, from Rumah Batik: www.rumahbatik.com/artikel/131-makna-motif-batik-parang-1.pdf
- Anonymous. (2011, July -). *Fashion: Capriole Skeleton Dress*. Retrieved August 9, 2017, from Eragatory: <http://www.eragatory.com/Capriole-Skeleton-dress>
- Anonymous. (2016, July 8). *Articles: What is the best type of plastic for my 3D printing application?* Retrieved August 9, 2017, from 3D Matter, Unlocking Material Properties: <http://my3dmatter.com/what-is-the-best-type-of-plastic-for-my-3d-printing-application/>
- Budge, K. (2016, November 1). *Museum of Applied Art and Science*. Retrieved August 8, 2017, from maas.museum: <https://maas.museum/inside-the-collection/2016/11/01/printing-fashion-in-3d-the-inbloom-dress/>
- Lilia Sabantina, F. K. (2015). Combining 3D printed forms with textile structures - mechanical and geometrical properties of multi-material systems. *IOP*

Conference Series Materials Science and Engineering (p. 2). Research Gate.

Imiraethnique. (2016, June 18). *Imiraethnique*. Retrieved from Imiraethnique: <http://www.imiraethnique.com/?p=426>

Nayenggita, L., & Drs. Yan Yan Sunarya, M. (n.d.). Eksplorasi Laser Cut pada Ragam Hias Batik sebagai Produk Fashion. *Journal Tingkat Sarjana Bidang Seni Rupa dan Desain*, 1-15.

Parnomo, K. (n.d.). nilai kearifan lokal dalam batik kawung. *jurnalugm.ac.id*, 1-13.

Peleg, D. (n.d.). *The Process: HOW I 3D PRINTED A 5 PIECE FASHION COLLECTION AT HOME*. Retrieved August 9, 2017, from Danit Peleg: <https://danitpeleg.com/the-process/>

Perry, A. (2017). 3D printed apparel and 3D printer: exploring advantages, concern, and purchases. *International Journal of Fashion Design Technology and Education* (p. 2). Research Gate.

Safiera, A. (2014, December 15). *Perkembangan Busana Futuristik dari Teknologi Printer*

3D di Industri Mode. Retrieved August 3, 2017, from wolipop.detik.com: <https://wolipop.detik.com/read/2014/12/15/155352/2777769/233/2/perkembangan-busana-futuristik-dari-teknologi-ltigitprinterltigt-3d-di-industri-mode#picmp>

Tsalashra, A., & Dr Ratna Panggabean, M. (n.d.). Eksplorasi Corak Batik Belanda dengan Efek Tiga Dimensi. *Jurnal Tingkat Sarjana Bidang Seni Rupa dan Desain*, 1-7.

Yap, Y. L., & Yeong, W. Y. (2014). Additive manufacture of fashion and jewellery products: a mini. *Virtual and Physical Prototyping* (p. 3). Research Gate.

Business Hotel Interior Design with Modern Luxury Concept and Natural Nuance

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Abstract — Business hotels as one of the hospitality industry continue to grow. One reason is because of economic development in a region. With this development, many businessmen come and do business activities in that specific region. The interior design of a business hotel with modern, luxury, and natural concept aims to give luxurious and functional impression as well as comfortable feeling like we feel at home in order to increase the selling value of a business hotel. The application of modern luxury concept and natural nuance in the business hotel's rooms are applied to all interior elements, such as the use of up ceiling and geometric-shaped hanging lamps, wood panels arranged vertically on the walls, furniture with simple shape, and materials with gold paint finishing. The concept of luxury used in the interior can be adjusted to the standard price of a business hotel by using a more affordable substitute material and a luxurious impression finishing.

Keywords – *business hotel, interior design, luxury.*

1. INTRODUCTION

The luxury hotel industry has become a significant segment of the general hospitality industry and is undergoing a rapid growth. In February 2013, the Forbes Travel Guide Star Awards selected 76 five-star hotels and 226 four-star hotels worldwide as the award winners, a yearly increase of 33% and 28.4%, respectively. In September 2013, the Forbes Travel Guide Star Awards updated the information that the numbers of five-star hotels and four-star hotels increased to 83 five-star and 264 four-star hotels, an increase of 9% and 16.8%, for each in just six months. It means every week one more new luxury hotel was built in the world during this time period^[1].

Economic development within a region also affects the number of hotels in that area. This is also applied for the business hotel. This factor encourages many people to do

business activities in that region. Those businessmen will need temporary shelter while doing their business activities.

Interior design in business hotels plays an important role in customer satisfaction. According to Frank Sorgiofanny the concept of luxury is changing. It is no longer just razzle-dazzle extravagances for customers, such as room service from well-dressed waiters or expensive spa treatments. The idea of luxury is more about well-designed rooms and unique experiences which allow guests having time to relax yet also enabling them to remain easily connected to the outside world^[2]. Combination of luxury and modern concepts that are functional with natural nuances, interior design of business hotel is expected to be able to provide comfort and a pleasant experience to visitors during their stay.

The concept has several characteristics, which are using geometric-shaped furnishing, using

interior elements that have higher aesthetic value than the functional value, using neutral colors, using natural materials, and using more affordable replacement materials (e.g. hpl and granite for marble replacement, and multiplex with gold or silver paint for finishing).

2. LITERATURE STUDIES

A. Business Hotel

Based on research by Rahma Mastovani in 2014, a business hotel is a hotel that has facilities that can accommodate all visitors' business activities. Business hotels are usually used for meetings and gatherings in a big scale and hotels for businessman guests. [3]

In determining the location of a business hotel, access to the center of trade and services should be easy and fast. The circulation of each zone should be explored and designed to achieve convenience target of the hotel costumers. Other characteristics is the entertainment facilities, such as karaoke room and sports facilities namely swimming pool and fitness center only as a complement that is adjusted to the hotel class.

The distinction between business hotels and hotels in general is the additional leisure facilities. Generally, business people who travel on business trip do activities in the morning and come back to the hotel as a place to rest at night only. Therefore, in general the design of business hotels tends to be more efficient in terms of facilities and has a lower price compared to regular hotels.

B. Luxury Concept

The definition of luxury and things related to it often to be blurry It depends on people's perspective (Kapferer, 2008) [4]. Luxury goods can be defined as things people buy but are not necessarily needed. Consumers of luxury goods buy on the basis of desire; They do not buy 'stuff', they buy feelings that produce a certain experience instead.

The characteristics of luxury interior design are:

- Use of furnishing with good quality of material and workmanship.
- Use of interior elements that have an aesthetic value more than their functional value. The interior element is regarded as a work of art, not just a functional object.
- Use of precious metal materials, such as gold and silver.

C. Modern Concept

Interior design with a modern theme, as people know, became popular during the post-World War II era. In fact, modern themes are rooted/originated from decorative art in the early 20th century, especially in the period of Art Deco. The concept of using innovative new materials, such as plastics influence modern and contemporary lifestyles. [5]

The characteristics of modern interior design are:

- Use of interior elements with a form that follows the function, non-ornament.
- Use of interior elements with geometric shapes in the form of a rigid square, a curved-end, or form a perfect curve and circle or oval.
- Use of plain material; non-pattern.
- Use of fabricated material, such as wood, plastic, metal, and shiny materials.

D. Natural Concept

Natural can be interpreted as a balance and harmony. Natural interior design is about making the space as natural as possible. The natural design will bridge the outdoors and indoors so that they turn into a harmonious and balanced unity.

The characteristics of natural interior design are:

- Use of natural materials, such as wood and natural stones (granite, onyx).
- Use of plants as interior elements, such as potted plants, small gardens, vertical garden or others.

3. DESIGN METHODS

A. Data Collecting Methods

The design and data collecting methods used in the design process are:

- a) Literature studies about business hotel, hotel interior design, modern, luxury, and natural concept.
- b) Real observation on the location of business hotel to observe all the activities held in public and private spaces.
- c) Questionnaire about which business hotel atmosphere is preferable by costumers.

B. Research Results

Based on the observation, it is concluded that:

1. Facilities that mostly used in business hotel are meeting rooms, restaurant, lounge, and business center.
2. The quality of additional facilities, such as meeting rooms in a business hotel will determine the visitors' satisfaction.
3. A fully facilitated public space and a functional interior design adds visitors' interest to use the facilities.

Based on the questionnaire distributed online and filled by 77 respondents who have visited business hotel, it is concluded that the preferred atmosphere of hotel visitors is a beautiful and luxurious atmosphere (44.2%), with other options, such as relaxed and comfortable atmosphere as their own home (39%), and the atmosphere of the space corresponding to the function (16.9%).

4. DESIGN CONCEPT

The concept of modern luxury will make the hotel looks classy, luxurious, yet still functional and affordable in terms of price that suit the business hotel's price range. While the natural concept is added as the adoption of an - eco-friendly lifestyle, mind refreshment, and a comfort-warmth home-like experience.

Modern and luxury concept design use material with glossy finishing, for instance,

using cheaper materials, - such as granite, hpl, and multiplex which resembling precious metals finishing and the use of furniture in the form of minimalist and simple with neutral colors.

To create a natural impression, natural materials, such as wood and rocks can be used. Addition of plants in the room will also add fresh and shady impression.



Figure 1. Color used in modern, luxury, and natural concept
(Source: Pricilla Devi, 2017)

The colors used in this concept are the derivative colors of brown as the natural color of wood and representing the natural concept, the gold color as characteristic of the luxury concept, and the color black and white which are the neutral colors as characteristic of the modern concept.

5. DESIGN RESULT

A. Bedroom

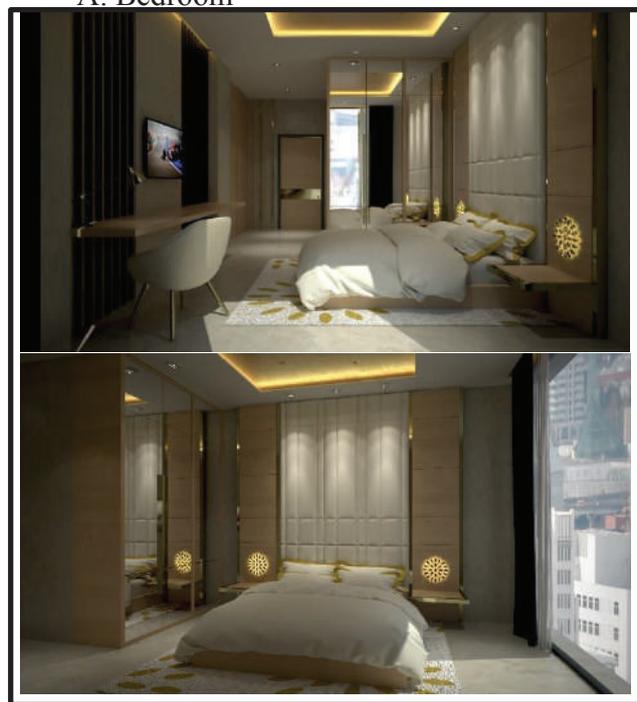


Figure 2. Bedroom
(Source: Pricilla Devi, 2017)

The bed uses white sheets with a golden-edge cushion. There is a padded panel backdrop with a simple shape that functions as a headrest. Lamps with the form of flower

transformation as an element that describes the natural concept with multiplex materials painted gold resembling brass as a luxury and modern concept's applications.

On the left side of the bed there is a wardrobe with mirror doors to add a spacious impression on the room and increase the intensity of light that comes in from the window.



Figure 3. Bedroom
(Source: Pricilla Devi, 2017)

On the opposite wall, there are wood-made wall panels made from hpl and arranged vertically from floor to ceiling as an aesthetic element that carries the simplicity of modern concepts.

A desk in front of the panel is provided as a place to put goods. The desk is equipped with a work lamp to facilitate those guests who want to work.

B. Restaurant

In the buffet area, there is a buffet table with wall panel made from thin-sized wood and mounted vertically from the table up to the ceiling. The selection of wood materials aims to add a natural impression on the room. There is an aesthetic element in the form of a flower shape transformation using LEDs behind it. This aesthetic element is arranged with different size compositions to create a non-monotonous harmony. Material selection of multiplex with gold paint finishing that resembles brass will add impression of luxury in the room.



Figure 4. Buffet Area - Restaurant
(Source: Pricilla Devi, 2017)



Figure 5. Seating Area - Restaurant
(Source: Pricilla Devi, 2017)

In the dining area, the table used is a table made of metal framework with gold paint finishing and granite as a top table. This geometric and functional table combines modern concept in terms of shape, luxury concept in the selection of metal material and finishing, and natural nuance in the selection of granite material as natural material.

C. Lounge



Figure 6. Coffee Bar
(Source: Pricilla Devi, 2017)

In the coffee bar area, there is a table with a table top made of white hpl and golden painted wood on the bottom of the table. The concept of luxury is visible from the installation of golden wood, coupled with the use of glass and gold hanging lamps on the top of the bar.



Figure 7. Lounge
(Source: Pricilla Devi, 2017)

In the lounge area, the furniture used is an armchair with a dining chair's standard height and a sofa set with armchair and coffee table. The use of furniture with geometric shapes and neutral colors indicates the modern concept used.

In the lounge area, there are many wide windows on the side that are utilized as natural daylighting. In this area, there are also several columns covered with patterned marble hpl to show the impression of natural and luxury. The column is highlighted with light from the floor and ceiling to bring out the magnificent impression of the room.

6. CONCLUSION

There are several points that can be taken as conclusion:

1. The modern, luxury and natural concept of a business hotel will enhance the comfort, beauty, and luxury of the room thereby increasing the selling value of the business hotel.
2. The application of modern luxury concept and natural nuance in business hotel rooms are applied to all interior elements, such as hanging lamps with geometric shapes and neutral colors on the ceiling, panels with wood material and arranged vertically on the wall as a fusion of modern concepts (geometric formation) and natural (wood material), led lights on up ceiling as aesthetic elements, and others.
3. The concept of luxury can be applied to business hotel standards by using a cheaper substitute material with luxurious finishing impression. For example, gold painted multiplex can be used as a substitute for gold metal or the use of hpl and granite patterned marble instead of marble.

ACKNOWLEDGEMENT

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REFERENCES

- [1] Barnier, Virginie de. (2014) *Which Luxury Perceptions Affect Most Consumer Purchase Behavior? A Cross Cultural Exploratory Study in France, The United Kingdom, and Russia.*
- [2] Lim, Serene (2017). *Why affordable luxury hotels brands are heading to Asia.* Website: <http://www.jllrealviews.com/industries/affordabl-e-luxury-hotels-brands-heading-to-asia/>
- [3] Mastovani, Rahma. (2011). *Hotel Bisnis Bintang 4 di Jambi*
- [4] Heine, Klaus. (2011). *Concept of Luxury Brands. Berlin.*
- [5] Haynes. (2016). *History of Modern Interior Design.* Website: <http://www.haynesbrosfurniture.com/news-1/a-history-of-modern-interior-design>

Maximizing Coworking Space Interior Design as a Collaborative Space for Youth Productivity

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Abstract — The concept of coworking space is a network among multiple workspaces around the world, a semiformal atmosphere venue that allows a variety of results oriented worker communities to collaborate. At this time, Coworking space in Indonesia has many advantages, among others, the cost required to rent space is not too much because of the concept of sharing space. Coworking space's user can use the address as an office address making it easier to register documents for business establishment. Coworking space is predicted to be a new trend to work outside the office. There is several factors in interior which can support user productivity while working. This research discusses the minimum requirement of furniture, lighting, temperature, noise & spatial arrangement specifically for coworking space.

Keywords – *Interior Design, Coworking Space, Productivity*

1. INTRODUCTION

PwC's 2013 NextGen Study found that Millennials want more flexibility and the opportunity to shift hours, if they were able to make their current job more flexible 64% would occasionally work from home and 66% would shift their work hours. This is supported by research from the Intelligence Group: 74% of the Millennials they surveyed wanted flexible work schedules and 88% favoured the kind of collaborative culture offered by flexible working environments over competitive culture.

Flexible working styles mean the boundary between work and home is increasingly blurred. Many Coworking Spaces have tapped into this by creating environments that resemble trendy coffee shops more than corporate Headquarters.

Coworking Spaces provide collaborative environments where companies can formulate ideas. Coworking is centered on creating space

which supports collaboration, openness, knowledge sharing, innovation, and the user experience. Demand for coworking space has been driven by the growth of creative and tech industries as well as the changing nature of work.

The number of members using coworking spaces globally has been steadily increasing year on year and is predicted to reach one million by 2018. Coworking has traditionally been favored by start-ups and entrepreneurs as a flexible and collaborative workplace solution. With four million new businesses being registered worldwide just in one year, coworking spaces are witnessing increased demand.

With peer to peer mentorship and greater access to other entrepreneurs, micro businesses and independent workers gain an advantage. Coworking providers offer well designed open spaces with lots of natural light and floor plans that emphasize community.

Therefore, it's important to study some factors which can maximizing productivity of coworking space as a collaborative space for youth. By increasing number of youth productivity they can also increasing the national income at all economic sectors where they work at.

2. METHODOLOGY

The method used in this research is the study of literature. The study of the literature that we use is by collecting a wide range of issues, facts and data from a variety of sources about how to increase productivity at interior office, some factors which can create worker-productivity. The analysis of the various problem that are being faced by coworker at coworking space. Conclude the hypothesis/some solutions from the analysis then strengthen the hypothesis with the study literature from different sources

3. DISCUSSION

The concept of productivity was studied by Hameed and Sheila in 2009 that identified interior design factors that affected employee productivity.

From the concept of Leaman (1995) and Brill et al (1984) in five factors: furniture, noise, lighting, temperature, and spatial arrangement. In this concept there is addition of spatial arrangement factor (spatial arrangement) which also have significant influence to increase employee productivity.

3.1. Furniture



Figure 1. Movable Furniture

Source: Walidonna (2017)

Coworking space furniture must be in match with

the character of the user at the coworking space. User segmentation is at young age between 18-30 years old who has high mobility and innovative mindset. Then the work seats which applied must fit with the anthropometry size of the human body.

It should allow users to move from one place to another which can defined the collaboration concept in coworking space.

3.2 Noise

Acoustics in coworking space should be minimized so that users can do their work effectively. In accordance with SNI (1993) within the visual comfort range it states that sound comfort is set at 40-45 dB.

Here are some applications that can be done to reduce noise in coworking space: 1) Localization and isolation of some equipment that has the potential to cause noise above average. Eg: paper shredder etc; 2) Coating the floor with a thick underlayer, especially for the circulation area. Reduces noise caused by footsteps; 3) Coating the wall with acoustic vinyl wall covering, for silencing the reflection of sound through walls; 4) The use of acoustic perforated gypsum for the ceiling module, reducing the reflection of sound through the ceiling, and for the noise caused by vibration blower outlet AC can be muted. 5) Replace vertical blind with textile type that is more soft / thick. Can also replace vertical blinds with plain curtains that are thick. So the distribution of sound through the reflection of the glass wall can be reduced. This will also help reduce background noise from outside the window.

3.3 Lighting & Temperature

According to Green Building Council Indonesia, Providing thermal comfort and ventilation quality by analyzing the placement of the configuration and type of windows and skylights and providing the emmadai, shading is controlled to avoid "hot spots" caused by direct sunlight; Provide direct air of individual and temperature control at each workstation location. Utilizing the CO2 sensor to assess the air quality of the chamber to adjust the ventilation;

Daytime natural lighting must meet the following requirements: a) daytime natural light should be put to good use; B) in the utilization of natural light, the inclusion of solar radiation directly into

the building should be kept to a minimum. The light of heaven must take precedence over direct sunlight; C) In accordance with SNI 03-6575-2001 stating that the illumination standard is

Table 1. SNI Tingkat Pencahayaan Ruangan Kantor

Source: SNI Pencahayaan, 1991

Room	Level of Lighting (lux)	Color Rendering Group	Color Temperature		
			Warm White <3300 K	Cool White 3300 K – 5300K	Daylight >5300K
Workstation	350	1 or 2		•	•
Computer Room	350	1 or 2		•	•
Meeting Room	300	1	•	•	

reaching 200 lux for the brightness of a space. This same standard issued by Ernest Neufert also states the brightness of the room's illumination standard of 200 lux.

As for the temperature according to SNI-14-1993-03 states the thermal comfort area in buildings that are in condition for the Indonesian people is cool cool, between the effective temperature 20.8 ° C - 22.8 ° C. Optimal comfort, effective temperature 22.8 ° C - 25.8 ° C. Warm comfortable, between the effective temperature 25.8 ° C - 27.1 ° C.



Figure 2. Maximizing Daylight at Coworking Space

Source: Walidonna (2017)

3.4 Spatial Arrangement

The layout in the coworking space should be adjusted so that users can interact with others but on the other hand should focus on what it does. In accordance with the guidelines of the Green

Building Council of Indonesia, a workplace designed and operated should be able to provide a high level of visual, acoustic and thermal comfort for its occupants, which supports the effectiveness and creativity of workers. Similarly, the Design to reduce stress and facilitate relaxation conditions, by providing space that supports privacy in vision and acoustic systems but still giving the occupants a chance to hold formal and informal meetings;



Figure 3. Example of Coworking Space Layout

Source: Walidonna (2017)

Coworking space must have 2 sections, the first section is a section that can be used for public and the second section is used to do work that requires privacy.



Figure 4. The Pod at Coworking Space

Source: <http://everythingcoworking.com/wp-content/uploads/2015/03/Vitra-Work-Booths.jpg>

Provides an attractive visual environment and at the same time, design for a balance between functionality and aesthetics. Provide additional

green elements in the form of natural vegetation in the room if possible;

4. CONCLUSION

To maximize the productivity of a coworker in coworking space it is necessary to pay attention to five factors: 1) The furniture used should allow the coworker to move between one workspace and another workspace to create a collaborative atmosphere; 2) setting the interior acoustics by reducing the time of buzzing inside the workplace by using sound-absorbing materials; 3) Daylighting should maximize daylight entering the room and must be adjusted to the maximum standard of lighting in the room; 4) Arrange the indoor air with artificial airflow and adapt it to climate standards in each typical climate; & 5) Spatial Arrangement, Layout must match the collaborative value in coworking space without overriding the ergonomics factor in the preparation of the coworking space layout.

REFERENCES

- Botsman, R. and R. Rogers (2010) *What's Mine is Yours: The Rise of Collaborative Consumption*, New York: HarperCollins.
- Brill, M. Margulis S, & Konar E, BOSTI (1984), "Using Office Design to Increase Productivity", Workplace Design and Productivity Vol. 1, 1984: Vol. 2, 1984., pp 495 500.
- DeGuzman, G. V. and A. I. Tang (2011) *Working in the "UnOffice": A Guide to Coworking for Indie Workers, Small Businesses, and Nonprofits*, San Francisco: Night Owls Press.
- Hameed, A., & Amjad, S. (2009). *Impact of Office Design on Employees' Productivity: A case study of Banking Organizations of Abbottabad Pakistan*. Journal of Public Affairs, Vol. 3(1), 1-12.
- Hameed, dkk. 2009. Journal of Public Affairs, Administration and Management: *Impact of Office Design on Employee's Productivity: A Case study of Banking Organizations of Abbottabad, Pakistan* (Online), Vol. 3 (1), (<http://journalofpublic.administration.banking.pakistan/employee.productivity.html>), diakses 10 Januari 2017).
- Jones Lang LaSalle IP, Inc (2017, August 18th). PwC's NextGen: A global generational study 2013 [Online]. Available : <https://www.pwc.com/gx/en/hr-management-services/pdf/pwc-nextgen-study-2013.pdf>
- Kristianto, Thomas Ari., Nastiti, Sri., Argoasmoro., 2015. *Evaluasi Akustik Interior Kantor Bersistem Terbuka Berukuran Besar Studi Kasus Kantor BAUK ITS*, Self Publishing
- Sedarmayanti. 2009. *Dasar-dasar Pengetahuan tentang Manajemen Perkantoran: Suatu Pengantar*. Bandung: Mandar Maju.
- Suptandar, J.P, (2004), *Faktor Akustik Dalam Perancangan Disain Interior*, Djembatan, Jakarta.
- SNI 03-2396-1991 tentang "Tata cara perancangan pencahayaan alami siang hari untuk rumah dan gedung"
- Sourcing Industry Group (2017, August 18th). The Coworking Revolution [Online]. Available : http://www.sig.org/docs2/DTZ_-_The_CoWorking_Revolution.pdf

Maximizing Japanese Style in Restaurant Interior Design

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Abstract — Restaurant is a commercial venture which sells food and beverages. In addition to the taste of food, nowadays consumers also consider the restaurant atmosphere, layout, circulation, and characteristic. The characteristic of a restaurant can be obtained through the application of an interior design style. Japanese style can be applied to restaurants, especially for restaurants serving Japanese cuisine. The characteristic of Japanese interior design style is simplicity, using geometric shape, natural materials, and Japanese typical elements. The methods used in this research are data collection, data analysis, and design process. This research will try to process Japanese characteristics into interior elements, furniture, and materials. This research is expected to produce an interior design by maximizing the application of Japanese style characteristics. The goal is to create a Japanese atmosphere at a restaurant to show restaurant characteristic and identity.

Keywords – *Interior Design, Japanese Style, Restaurant*

1. INTRODUCTION

Restaurant is a commercial venture which serves food and beverages to the consumer. Restaurant is located in a part or entirety of a permanent building. The purpose of restaurant operations is to gain profit and make consumers feel satisfied.

Nowadays, consumers not only consider the taste of food as their reason in choosing a restaurant. The restaurant atmosphere, layout, circulation, and characteristics of a restaurant are also considered by the consumers (Hapsari, 2017). These things become consumer considerations because consumers do other activities besides eating their dishes. Consumers are chatting with their family or holding a meeting in the restaurant.

Japanese restaurant is a restaurant which serves a variety of Japanese specialties. Japanese restaurant service system usually follows the service system in Japan. In addition, Japanese restaurants are usually supported with Japanese style interior design so that consumers can feel the Japanese atmosphere while enjoying their

meal.

Japanese style interior design has several characteristics. The form used in Japanese style is a line dominated form, geometric, and simple. Materials used in Japanese style are natural materials, such as wood and paper (Mangunwijaya, 1992). Japanese style interior design usually also uses some typical elements of Japan, such as shoji (wooden frame and paper panel), tatami (straw mat), cherry blossom, and others.

In applying Japanese style to a Japanese restaurant interior design, it is necessary to pay attention to restaurant identity. The identity of a restaurant can be distinguished from the type of food served, the service system, and the consumer segmentation. By maximizing the application of Japanese style interior design characteristics, it is expected to show the identity and characteristic of a Japanese restaurant.

2. METHODS

Methods used in this research are data collection, data analysis, and design process.

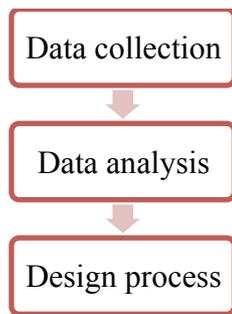


Figure 1. Research methods chart

Source: Permanasari (2017)

Data collection in this research is conducted with literature study. The literature study is obtained through books and previous research. The aim of literature study is to obtain data on restaurant, Japanese restaurant, and Japanese style interior design.

Data from literature study will be analyzed. The analyzed data are the types of restaurant, rooms in Japanese restaurant, characteristic of Japanese style interior design, and typical Japanese elements. The typical Japanese elements which will be analyzed in this research are shoji, tatami, cherry blossom, kanji, and Hakata Ori. The obtained data will be used for the design process.

Design process is the stages of creating design concept and its visualization. Design concept made in this research covers the visualization of shapes, materials, colors and other interior elements.

3. DISCUSSION

Japanese restaurant has several types of dining rooms. Wijaya (2013) stated, “Japanese restaurants generally have three dining rooms, namely the common dining room, tatami room, and bar”. The common dining room uses tables and chairs like restaurants in general. Tatami room is a dining room which doesn’t use a chair, but uses tatami as a floor seating material. The bar is a dining room which uses bar table and bar stools, for example sushi bar and teppanyaki bar. The bar table is used by chef for cooking and used by consumer to enjoy their dish.

Japanese style interior design has three main characteristics. The first one is the use of natural materials, in accordance with one of Japanese principles of life which is close to nature (Mangunwijaya, 1992). The second

characteristic is simple and geometric form (Murata, 2005). The shape can be applied to furniture, aesthetic elements, and other interior elements. The last characteristic is the use of typical Japanese elements. Japanese typical elements which can be used in a restaurant interior design are shoji, tatami, cherry blossom, kanji, and Hakata Ori.

3.1 Floor Concept

In accordance with Japanese style characteristics, the restaurant floor can be designed using natural materials. Natural materials which can be used as floor materials are wood, stone, bamboo, and tatami. Tatami is a straw mat used as a traditional Japanese floor material.

Natural materials used for the restaurant can be tailored to create an interior atmosphere. For example, wood parquet and tatami can be used to create a warm atmosphere. Wood parquet can be used throughout the dining area, whereas tatami can be used in floor sitting area.



Figure 2. Wood parquet and tatami floor

Source: Permanasari (2017)

3.2 Wall Concept

To maximize Japanese style in restaurant interior design, motifs of Japanese typical elements can be applied on wall. For example, a 4.5 piece tatami arrangement motif can be used. Tatami arrangement creates a simple and geometric motif that suits Japanese characteristics.



Figure 3. Tatami motif applied on wall

Source: Permanasari (2017)

In addition to massive walls, restaurant in general also require non-massive walls such as partition as room divider and to provide privacy. The partition used in traditional Japanese house is shoji. Shoji is a panel of wooden frames and transparent paper.



Figure 4. Shoji as partition in floor seating area

Source: Permanasari (2017)

To maximize Japanese style, some motifs from Japanese typical elements can also be applied to partitions. The motif can be selected based on a restaurant identity. For example, ramen motif is used because the restaurant's identity is a ramen specialty restaurant. The motif can be applied to partition easily through laser cutting technique.



Figure 5. Ramen motif applied to laser cutting partition

Source: Permanasari (2017)

3.3 Ceiling Concept

One of the characteristics of Japanese style is simplicity. Therefore, the ceiling can use a non-patterned material to balance patterned walls. Gypsum, plywood, and GRC board are the examples of non-patterned ceiling material. In some areas, drop ceiling with simple wood motif can be applied as an accent. The goal is that the ceiling is not monotonous.



Figure 6. Gypsum ceiling and drop ceiling with wood motif

Source: Permanasari (2017)

Natural materials, such as wood, can be applied as a non-massive ceiling which resembles a pergola. The pergola can be equipped with artificial cherry blossom. Consumers sitting under the pergola can feel as if they are sitting under a cherry blossom tree.



Figure 7. Pergola with artificial cherry blossom

Source: Permanasari (2017)

3.4 Furniture Concept

In accordance with Japanese characteristics, furniture is designed using natural materials. One of natural materials which can be used for furniture is wood, such as mahogany, red pine, cedar, and others. Synthetic materials which resemble natural materials can also be used. Wood can be replaced with laminated plywood. In addition, upholstery is also used on furniture to provide comfort to user.

The furnitures are designed using simple and geometric shapes in accordance to Japanese style characteristics. To maximize Japanese style, furniture can be designed from shape transformation of Japanese typical elements. For example, the shape of kanji can be applied on dining chair. Among the various kanji characters, the kanji of number 5 and 9 have simple forms and easy to transform into a chair.



Figure 8. Dining chair and bar stool

Source: Permanasari (2017)

Kanji can be applied directly into furniture without going through shape transformation. Kanji of numbers can be used as table numbers, applied on the side of the dining table. On the top table, kanji can be applied in form of Japanese proverbs. The proverbs are related to consumer segmentation. If the consumer segmentation is urban office workers, then the proverb given should be a positive proverb to lift the consumers spirit.



Figure 9. Dining table

Source: Permanasari (2017)

3.5 Aesthetic Element Concept

The aesthetic element of restaurant interior design can use Japanese typical elements. The Japanese typical elements should be selected based on restaurant identity, the desired atmosphere, and function. For example, a ramen specialized Japanese restaurant from Hakata, Fukuoka can use the distinctive elements of mentioned area. One of Hakata's distinctive elements is Hakata Ori, a woven fabric for kimono belt. Hakata Ori motifs can be applied into interior elements.



Figure 10. Hakata Ori motif applied on bar table

Source: Permanasari (2017)

Japanese typical elements can create a certain impression on the restaurant. For instance, a cherry blossom tree surrounded by chair in dining area can create the impression of enjoying a meal under a cherry blossom tree. The cherry blossom tree used in this research is an artificial one to because it is more efficient than the real one.



Figure 11. Dining chair with artificial cherry blossom tree

Source: Permanasari (2017)

A Japanese typical element which is chosen based on its function is lantern. Japanese usually use lanterns as an accent lamp on the restaurant. In addition to lanterns, lamp armature can be designed using a motif from Japanese typical elements. For example, tatami arrangement motif is used as a hanging lamp armature.



Figure 12. Hanging lamps

Source: Permanasari (2017)

3.6 Color Concept

The dominant color used in Japanese style interior design comes from natural materials. In

this research, the natural material used is wood so that the dominant color is brown. Brown has the characteristics of warm, comfort, stable, natural, and traditional (Meerwin, 2007).

The accent color used in this research comes from Japanese typical elements. The pink color of cherry blossom has feminine, soft, and cheerful characteristics. The red color of lantern has provocative and passionate characteristic. The white color of shoji paper has bright, open, and neutral characteristic. The last accent color is black from tatami border, it has strong and dominating characteristics.

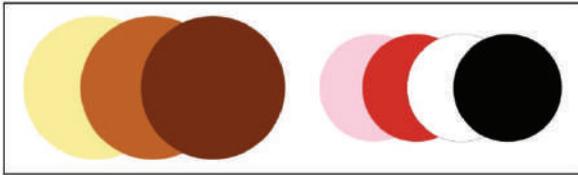


Figure 13. Color palette

Source: Permanasari (2017)

4. CONCLUSION

Japanese style interior design can be used as the identity of a restaurant which serves Japanese cuisine. Japanese style interior design characteristics are simple, using geometric shapes, natural materials, and Japanese typical elements. These Japanese typical elements can be directly applied to interior elements. For example, tatami can be directly used as floor material. Transformation of shapes from Japanese typical elements can also be applied to interior elements, such as the usage of tatami motifs on walls. Through direct application and shape transformation, Japanese style can be applied maximally to restaurant interior design.

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REFERENCES

Hapsari, W.T., Anggraita, A.W., Rucitra, A.A.

(2017). Redesain Rumah Makan Warung Apung Rahmawati dengan Konsep Jawa Modern. *Jurnal Sains dan Seni ITS Vol.6, No.1*.

Mangunwijaya, Y.B. (1992). *Wastu Citra: Pengantar ke Ilmu Budaya Bentuk Arsitektur*. Jakarta: Gramedia Pustaka Utama.

Meerwin, G. (2007). *Color – Communication in Architectural Space*. Zurich: Birkhauser Architecture.

Murata, Noboru, Tada, K., Metha, G. (2005). *Japan Style Architecture, Interior, Design*. Boston, Vermont and Tokyo: Turtle Publishing.

Widjaja, E. (2013). Studi Terapan Gaya Desain Interior Jepang Restoran Tomoto, Imari, Kayu, Nishiki Surabaya. *Jurnal INTRA Vol.1, No.1*.

The Usage of Snapper Fish Leather for Ladies Bags Design

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Abstract—Indonesia as a maritime country has abundant maritime products, the usage of those products are limited only on meat consumption. The experiments result snapper fish skin has durable and does not smell fishy leather. So snapper fish skin has a potential to processed into a leather goods. So it is becomes a business opportunity and has expected to compete with the other similar products on the local market. To make it happen it is required to create a product which has an attractive design and followed the latest fashion trend. Material character analysis, application technique of snapper fish leather analysis and trend analysis are conducted. And also made approach to consumers and stakeholders to decide the design concept. Outcome of this research is in the form of one set ladies bag are consisting by a purse, a mini bag and a tote bag.

Keywords – snapper fish leather, leather goods, ladies bag

INTRODUCTION

Based on the production of cultivation fishery data in 2003, east java is one of abundant brackish water fish which milkfish as the main product. East java has the largest area of Indonesian fishpond. In 2000 recorded that east java has 53.423 ha area of fishpond, it is about 15 % of Indonesian areas of fishpond (BPS 2002). The fishpond centred on Gresik and Sidoarjo whit each areas are 38,44% and 32,17% from all of east java fishpond (Dinas Statistik Jawa Timur 2003). So fish skin as the raw material can be found easily.

Exotic leather materials are constantly becomes the one part of role mode on every season of fashion show. Bags are made from exotic leathers has produced by Hermes, Gucci and many others famous brand. Now the usage of exotic leather is diverse. The usage of exotic leather material not only focused on reptile leather but also the others

too. It is signed by the increased popularity of stingray leather. The exotic value of stingray leather is shown by this appearance that looks like pearl. However the population of stingray is not enough and it has a long reproduction period. So the usage of stingray leather will threaten the population of stingray.

The usage of snapper fish leather on this research is became a solution from that problem. Snapper fish has cultivated on many locations in Indonesia and has a short reproduction period. Beside of that the usage of snapper fish leather also resolve the problem about 690-920 fish skin waste a day from fish processing plant.

Limitation of problems :

1. The snapper fish leather has been lack of exploration on design, so it is have not an economical value for society, especially for Indonesian community.
2. Snapper fish leather has a small dimension.

3. Decide the scraps module of snapper fish leather and find out the technique to connect the module until it is can applied on the products.
4. Find out the exploration method of snapper fish leather in order to have an interesting appearance.
5. Decide the design concept which suitable with the characters of snapper fish leather and the latest trend of ladies bag.

Limitation of design plans :

1. Products are designed for women on 25-35 ages of range.
2. Products are designed for urban people who have bachelor degree as the last education.
3. Products are designed by used snapper fish leather.
4. Products are designed for Indonesia market share.

METHODS

A. Collecting Data Phase

This research is used two kind of data, they are primary data and secondary data. The primary data collected by take a survey and deep interview from persona (someone who representation the users target) and stakeholder (company which has knowledge and competence to produce the product). The secondary data is about theory and information which collected from some literatures like paper, book, magazine and internet article. That theory and information are used as based of carry on the material experiments.

B. Study and Analysis Phase

1. Material analysis, for recognize the characters of material, especially snapper fish leather. Based on these analysis conclude about limitation and reference to execute the experiment are obtained

2. User analysis, for describe about user target characteristic. Outcome of user analysis are specific data about :

- a. Demographi data – classified about user background, it is refers to personal data and financial capability.
- b. Spychography data – classified about spychography character, it is refers to life style which they chosen. The user interest factors toward the product are concluded by those data.
- c. Persona – Specific demographic and phychography data which illustrated on someone who representative the target users classification. Those data find out from deep interview method.
- d. Muse – Illustrate data about someone who become role mode of persona, it is used to decide the limitations and references of design process.

3. Product analysis, for decide what kinds of product line up which will be designed and the part of product. It is belong to dimension and accessories.

4. Experiment analysis, exploration application alternative of snapper fish leather into a prototype. The prototype make by over and over which based for correct the last prototype before. The prototyping process are through these steps :

- a. Design concept analysis – to decide a design concept based on the latest fashion trend analysis.
- b. Material treatment analysis – to decided application method of snapper fish leather into the product.
- c. Series design analysis – to develop the product design and find out the differentiation method based on concept design.
- d. Prototyping process – to find out the result of application method into a real product. So it is can directly evaluated by human sense.

5. Design concept analysis, analysis process which conducted to the fourth point of experiment analysis result for decide the design concept which used.

RESULT & DISCUSSION

A. Product Concept

1. Product Concept

Based on users activity analysis which have been done on the muse, has concluded that the product will support a formal activity. The used concept on this research product is the truthful of material. Based on the truthful of material concept snapper fish leather is used as accessories, because it is has a small dimension.

2. Material concept

- a. The usage of snapper fish leather as accessories without changed the authentic characters.
- b. As a leather goods product it is combined with genuine leather as basic material.
- c. Cowhide pull up leather is used as basic material because it is has strong character and natural appearance.
- d. As a premium product the production process will be held by 100% handmade.

3. Theme Design Concept

The theme design concept has chosen base on macro fashion trend in 2016, that is trans theme. It is break into four micro trend, they are eco active, pop soft, deep ocean and past modern. From those indentification, micro deep ocean theme has chosen as the theme. It is because the usage of snapper fish leather as the special material.

a. Series design

Based on mindmapping result of the

theme design concept, coral reef character is chosen as base of differentiation series product development. Consideration of application coral reef characters as a theme is based on truthful of material concept. Snapper fish leather will be cut into some specific modules according to the dimension of snapper fish leather.

The series design development has obtained from module pieces experiment methods that approach to what kind of coral reef. From those experiments has obtained five series of design following this picture :

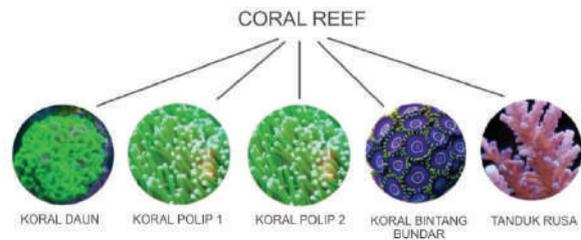


Figure 1. The points of series design

On the picture above the points of series design are named in bahasa because the product will be launched on Indonesia marketplace. Those points name will used as base to give a label for the product series.

Table 1. Snapper fish leather modules pieces experiments result based on the kind of coral reef.

KORAL DAUN	KORAL DAUN 1st	KORAL DAUN 2nd

KORAL BINTANG	KORAL BINTANG 1st	KORAL BINTANG 2nd
		
KORAL POLIP	KORAL POLIP 1st	KORAL POLIP 2nd
		
KORAL OTAK	KORAL OTAK	
		
KORAL BINTANG BUNDAR	KORAL BINTANG BUNDAR	
		
KORAL TANDUK RUSA	KORAL TANDUK RUSA	
		

b. Fashion style

The outcome product must be match according to Andien Aisyah (an Indonesian jazz singer who chosen as muse) characters of fashion style. Andien has an edgy chic fashion style which dominant to chic character. Miroslava Duma is Andien’s muse for fashion style. She is a famous fashion editor of magazine in Jerman.

Andien has classic looks for formal and boho looks for informal occasion. The fashion style of Andien Aisyah and Miroslava Duma will be illustrated on this pictures.



Figure 2. Moodboard of Andien Aisyah dan Miroslava Duma fashion style

Picture resources : edited from some resources

4. Final design

Based on description of concept design points which must implemented on the product, obtained five outcome of series design following these points :

a. Koral daun serial design



Figure 2. Outcome design of koral daun serial

b. Koral polip 1st serial design



Figure 3. Outcome design of koral polip 1st serial

c. Koral polip 2nd serial design



Figure 4. Outcome design of koral polip 2 serial

d. Koral bintang bundar serial design



Figure 5. Outcome design of koral bintang bundar serial

e. Tanduk rusa serial design



Figure 6. Outcome design of koral bintang bundar serial

5. Production process

Before make the product, dimension analysis by a blueprint based on the design should be made. That blueprint will be used for reference of models construction. These models will be made from 2 mm sheets of sponge. On this section the dimensions and accessories of the product will be evaluated to check the best proportion. It will made over and over until the fix proportion has found. Production process will begin refer to the last model.





Figure 7. The making process of product which implemented the fist series

B. Business Plant Concept

1. Branding concept

a. Brand name and logo

The usage of snapper fish leather in this product is the strength which has minimum competitors. So Iwei will be used as brand name. Iwei adapted from iwak, is a word from java language which has fish meaning in English. This word chosen based on the usage of snapper fish leather. Silhouette of fusiform fish body type is used to make a logo. It is arranged until make a shape like W in alphabet. W is chosen because it is the only one consonant on Iwei word. White and blue colors are chosen for the logo to represents the ocean.

b. The application of logo on the product attribute

The attribute of product are consist of this points :

Pouch : It is made from soft cloth to cover the product from scratches and dusk.

Paper : It is for accommodate the bag which contain the

Iwei product.

Hang tag : a card which hang on the product to describe about price, code and others information of the product.



Figure 8. Logo of Iwei brand in the hang tag

2. Stakeholder

a. Material Supply

Material supply is a snapper leather production plant which chosen based on the quantity outcome. The requirement of material supplier is should be produce 100.000 pieces of snapper fish leather a month to supply the necessary of Iwei production. That requirement is for shorten time for the production process.

b. Producer

Producer is a company who provided production leather goods services. The producer will be make the product only for Iwei by custom design and Iwei name will be put on that products.

3. Production steps

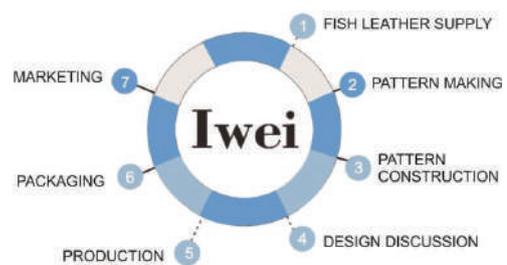


Figure 9. Illustration of production steps

There are two kinds of line from the picture above, the break line and continued line. The break line is illustrate the assignments of stakeholder. Those assignment points will run by Iwei control. Meanwhile the continued line is illustrate the Iwei assignments.

CONCLUSION

- a. Based on the experiments have obtained a conclusion that the usage of snapper fish leather is more effective if it is applied as bag accessories. It is related to the small dimension of snapper fish leather.
- b. The application of those accessories is by find out the specific modules shape which has a unity form.
- c. As a craft product based on leather material, cowhide or goatskin are used to make the body of the bag.
- d. The usage of leather as a craft product, generally expose the genuine character of the leather. So laminate method which changed the character of snapper fish leather are not allowed for make the product.
- e. Based on laminate experiment is known that the snapper fish leather is not water resistant. The liquid will be absorb into the leather pores and leave a mark which can not removed. So these product is only for indoor activity.
- f. Special treatment has needed in order to avoid the mark. It is by keep the product only on dry place and do not clean the product by wet duster.
- g. The other effort to develop the product is by applied the snapper fish leather into small product such as card holder, name tag, key chain, watches trap and many others.

REFERENCES

- [1] ALAM, G.M SURYA. 1990. Keterampilan Kulit Tersamak. Semarang : Aneka Ilmu.
- [2] SOEMARMI., KOESNAN., OETOYO, BAMBANG. 1989. Pedoman Pengawetan Kulit Mentah. Jogjakarta : Kanisius.
- [3] YUNITA, EKA. 2012. Patwork dan Quilting Kreasi Kain Perca untuk Bayi. Jakarta : Demedia Pustaka.
- [4] FARIDAH, IDA. 2015. Tugas Akhir Desain Serial Tas Kulit Wanita dengan Eksplorasi Material Logam Perak Berkonsep Ragam Hias Nusantara.
- [5] FIDH, UMI. 2016. Tas dan Dompot Cantik. Jakarta : Kriya Pustaka.
- [6] LINARDI, MARCELLA. 2013. Penggunaan Material Tyvek Sebagai Bahan Baku Pembuatan Tas Wanita, diunduh melalui <http://journal.ubaya.ac.id/index.php/jimus/article/viewFile/461/435>. downloaded on April 22nd 2015
- [7] http://djpen.kemendag.go.id/app_frontend/admin/docs/researchcorner/9731376299841.pdf, accessed on May 15th 2015
- [8] <http://www.bbkkp.go.id/>, accessed on April 12nd 2015
- [9] <http://terasolo.com/liputan-khusus/afta-mengukur-kemampuan-meraba-peluang.html>, accessed on 15th April
- [10] <http://daisyjanie.typepad.com/daisyjanie/2012/07/cool-patchwork-piecing-using-fusible-interfacing.html>, accessed on February 5th 2016
- [11] <http://www.departures-international.com/home/style/womens-fashion/fishy-fashion-accessories.html>, accessed on April 29th 2016
- [12] <http://www.fashionisers.com/trends/spring-summer-2015-handbag-trends/>, accessed on May 2nd 2016
- [13] [http://fashionvignette.blogspot.com/2014/06/trends-fashion-snoops-fw-2015-16-womens.html?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed:+FashionVignette+\(FASHION+VI+GNETTE\)](http://fashionvignette.blogspot.com/2014/06/trends-fashion-snoops-fw-2015-16-womens.html?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed:+FashionVignette+(FASHION+VI+GNETTE)), accessed on May 2nd 2016
- [14] http://biobook.nerinxhs.org/bb/systems/gas_exchange.htm, accessed on March 6th 2016
- [15] <http://www.growemiliacastus.com/spring-summer-17-trend-boards/>, accessed on July 3rd 2016
- [16] <http://www.greenappleflooring.co.uk/advice-centre/laminate-floor-advice/what-is-laminate-flooring.htm> accessed on January 18th 2017
- [17] http://www.polyvore.com/fendi_handbags/shop?brand=Fendi&category_id=318, accessed on January 22nd 2017
- [18] <http://picmia.com/119435-asymmetry-in-fashion-mustard-tailored-trousers-with-floral-applique-along-one-leg-interesting-garment-details-chloe>, accessed on January 22nd 2017
- [19] <http://dreaminginstyle.com/en/edgelands-ss17-trend-wgsn/>, accessed on January 22nd 2017

Signage Design Concept for Medokan Ayu Health Center Surabaya

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Abstract — Medokan Ayu Health Center is listed among several health centers in Surabaya that already earned ISO:9001 since 2008. As one of the most established health centers, Medokan Ayu Health Center has long developed an image branding for itself in the community which is called “Asri Berseri” or “fresh and clean” theme. From its green-painted wall to the constructed mini park inside the building, it was nicely done to emphasize the “fresh and clean” image. The health center also uses signage to mark locations and provide information for visitors. However, few days of direct observation showed that the signage used inside the health center is poorly designed and some of the placement aren’t effective enough to leave impression. To create a better signage system, a good design concept is needed that can complement the health center’s image and have the result more long-lasting. The concept is designed based on literature studies and design theories concerning the objects. Thus, the ‘fresh and modern’ design concept was born. It aims to make the signage appears more environmentally-friendly and modern-looking to suggest a calm and healthy atmosphere in the health center. This paper will further detail how the signage design concept was formed.

Keywords – Concept, Design, Health-Center, Signage

1. INTRODUCTION

Signage system has been widely used because of its helpful function especially in public places which are often filled with people such as hospitals, parks, stations, etc. Crowded place requires a system to organize the visitor’s traffic, the information dissemination, or simply to mark a specific location as applied in Medokan Ayu Health Center.

Medokan Ayu Health Center which gets certified by ISO:9001 in 2008 has made use of signage to lay out the health center’s rules and identify each location within the building. This health center also establishes the ‘fresh and clean’ theme to enhance its image branding among the local community.

However, some of the signages in the area aren’t well preserved and poorly made with barely proper materials. There are well-made ones using acrylic material but their design

really looks out of place because the colors used are very different to the image the health center try to build. In fact, a signage system can affect people’s insight and impression when they visit a new place. A good signage system calls for a design concept that meets the needs and an all-out execution. By redesigning the current signage, the signage system in Medokan Ayu Health Center will likely improve for the better and help strengthening the image building of the health center.

2. METHOD AND THEORY

This study uses several methods to create the signage design concept. The methods involved are direct observation and deep interview with literature studies in signage design and materials. Direct observation is arranged to take notice of the visitor circulations, routines, and accessibilities. From here on, it will be known where in the health center is full of visitor

activity or how much the existence of signage is required there.

Head of Medokan Ayu health center as stakeholder is interviewed to give more insight about the health center. Datas of Medokan Ayu health center from when it was first built and inaugurated on November 29th 1995 including condition of the land, its image branding, and visiting procedure are provided from this interview.

Books about wayfinding and signage system design are reviewed to produce a perfected and appropriate design concept, especially concerning the selection of signage type, signage form, color palette, typography, pictogram, and signage material to give the maximum impact. Then once the design concept is fixed, the output will be in the form of design on paper and 3D video simulation.

3. RESULT AND DISCUSSION

From direct observation in Medokan Ayu Health Center, it is showed that most of the visitors activity are centered around the waiting room. Areas such as the lobby, waiting room, and registration unit have a quite high density level because they are classified as public spaces by the health center. Therefore, important information is likely to be placed in the areas. A wayfinding map is also provide for visitors to find their way starting from when they first come until they leave after finishing their business in Medokan Ayu Health Center.

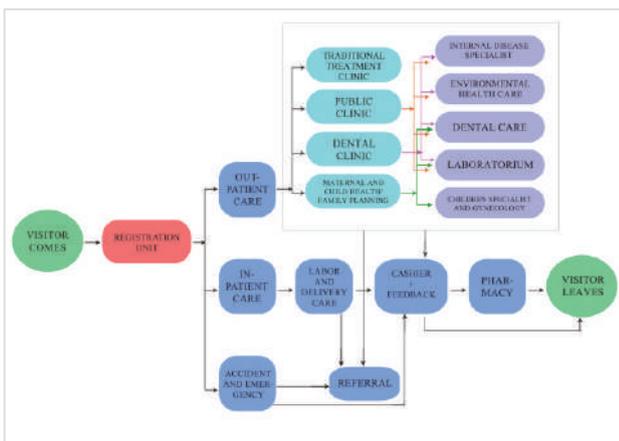


Figure 1. Wayfinding Map of Medokan Ayu Health Center

Then, as for the signage design concept, the ‘fresh and clean’ theme is modified to ‘fresh and modern’ considering the need to make the

design more long-lasting. The concept aims to deliver all important information from Medokan Ayu Health Center as friendly, as attractive, and as clear as possible. Fresh and modern mean creating a refreshing, comfortable, and environmentally-friendly impression with a modern touch to match today’s developing era. Further elaboration of the design concept is as follows:

A. Signage Form

Signage form can affect the application of signage system in Medokan Ayu Health Center because besides acting as media to relay information, signage form also directly reflects the ‘fresh and modern’ concept in building the health center’s image.

Signage form with pointed or sharp tip is avoided because it radiates the atmosphere of being alert, aloof, and rigid. It is very contrary to what the design concept try to convey which is to give impression of friendly, comfortable, open, and calm. Therefore, signage form with blunt tip that tends to form a quarter curve in each angle is chosen.

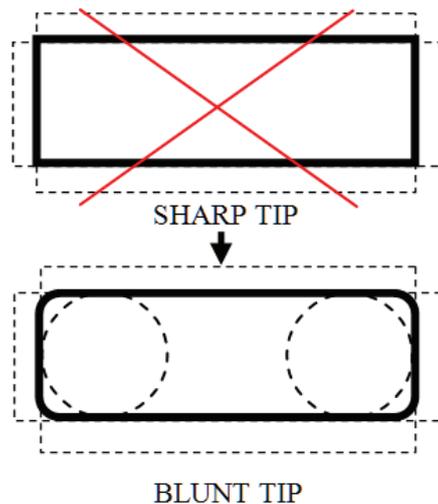


Figure 2. Wayfinding Map of Medokan Ayu Health Center

B. Color Palette

It can be said that color holds a vital role in the design application because it is the first thing people tends to notice at a glance. Colors can leave a certain impression in the eye of the beholder, not excluding the visitors of Medokan Ayu Health Center. To strengthen the ‘fresh and modern’ feel, several colors that fit the concept criteria are selected. The four dominant

colors are as follow:



Figure 3. Selected Color Palette to Represent The 'Fresh and Modern' Feel

C. Typography

Considering American Disabilities Act (ADA), the font type chosen is Comfortaa. As the font name itself implies 'comfort', the basic alphabet form of this font is a geometric sans serif with round type and not too tight spacing. Comfortaa gives off a flexible and modern vibe with clear readability.



Figure 4. Selected Color Palette to Represent The 'Fresh and Modern' Feel

D. Pictogram

Pictogram is a symbol which refers to an object, activity, or process. The presence of pictogram in the form of simple icons indicates to the various facilities in Medokan Ayu Health Center. It exists as a guide for visitors to understand the intend and purpose of signage information. The process of designing pictograms begins with rough sketches followed by redrawing and finishing using design software in computer.

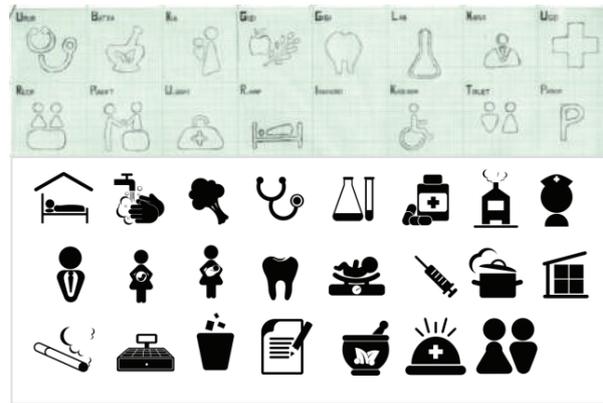


Figure 5. Sketches and Digital Version of The Proposed Pictograms

E. Materials

The basic materials used to make signage is from polymethylmetacrylate (PMMA) or better known as acrylic. The characteristic of transparent acrylic is being able to constantly absorb a small amount of sunlight despite an increase or decrease in the material's thickness. Acrylic is also more elastic than glass and technically more resilient to the pressure of dynamic water. In addition, this material is not easily mossy so it will be more durable either placed indoor or outdoor.

While the material used to support the standing signage especially for large-sized signage is iron with a mix of alucopan or aluminum composite panel (ACP). Alucopan has a polyethylene core composition between two aluminum plates and is coated with extra durable PolyVinylidene Fluoride (PVDF) as composite structure that produces stunning characteristics such as non-toxic plastic core, waterproof, heat insulation, sound insulation, and resistance to corrosion, pollution, and usage.

F. Signage Programming

Signage Programming means placing the signage according to the function, need, and surrounding. The placement for indoor identification signage in Medokan Ayu Health Center is already appropriate. But their outdoor directional signage needs to be placed right at the intersection after the main gate entry so anyone who comes can take notice of it. It is to facilitate visitors who drive and have to park their vehicles.

The same can be said for the indoor directional signage. It should be placed in where most visitors likely gather after entering the building to provide directions inside the health center, which is the lobby. Indoor orientation signage can also be placed around the lobby where it will be more noticeable.

4. CONCLUSION

This study resulted in signage design concept to improve the signage system in Medokan Ayu Health Center. This concept brings a theme that will suit the branding image of the health center that has been established before among the society. The 'fresh and clean' image which was used, with some modification, is changed into 'fresh and modern' for the signage design. It is to better meet the needs of visitors and to have a more long-lasting design.

A good design concept has to be accompanied by a good execution. Beside preparing a well-done concept, applying the design to the actual signage system requires a careful consideration. When this study is conducted, Medokan Ayu Health Center as the main stakeholder is very open to the result to be included as suggestive input. The development of signage system in Medokan Ayu is further handed over to the health center. In the future, the research team is ready to provide assistance concerning the design when Medokan Ayu Health Center finally decides to execute the signage design plan.

REFERENCES

Book

Gibson, David (2009). *The Wayfinding Handbook: Information Design for Public Places*. New York: Princeton Architectural Press.

O'Grady, Ken Visocky & Jenn (2008). *The Information Design Hand Book*, Switzerland: Rotovison.

Tinarbuko, Sumbo (2008). *Semiotika Komunikasi Visual*. Yogyakarta: Jalansutra.

Magazine

W., Okky Ardy. (2008). *Environmental Graphic Design (vol. 04 edition 2)*, Concept.

Article

Blogspot. (2015, January 5). *Pusat Kesehatan Masyarakat*.

<http://zahroniananta.blogspot.com/2014/03/pusat-kesehatan-masyarakat.html>

Wikipedia. (2015, January 5). Lahan Basah.

http://id.wikipedia.org/wiki/Lahan_basah

Interview

Januarsih, Siti. Personal interview. 18 Oct. 2014.



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