International Journal of Asia Digital Art and Design
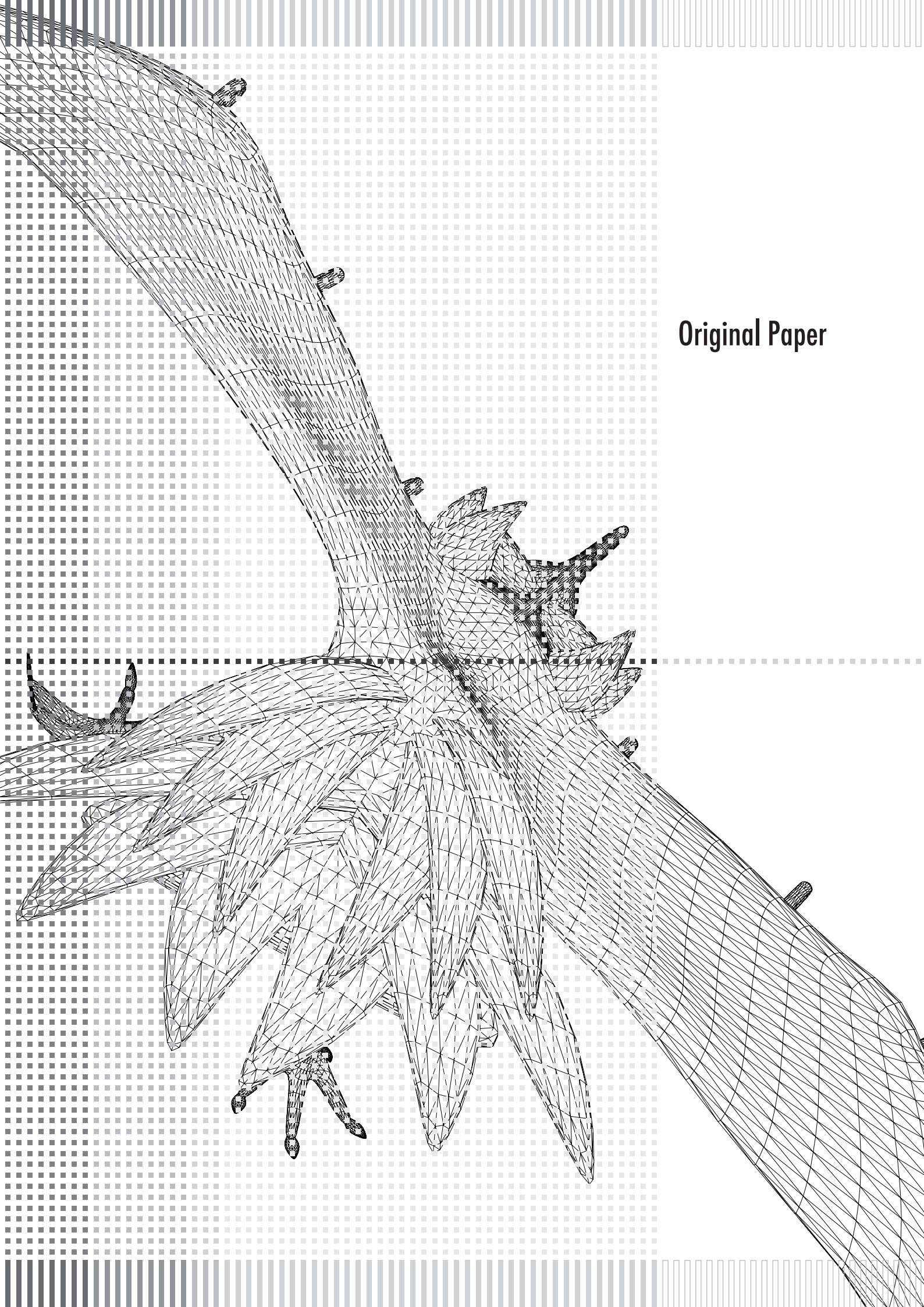
Contents

Categories for paper

· Original Article A paper in this category has to be a logical and empirical report of the study, the review and the proposal by the author on the issue of digital art and design based on media technology. It also has to include the novelty and academic values which can be shared with ADADA members or the people who study digital art and design.
Number of pages: 6 -10

· Art Paper A paper in this category has to consist of the author's practice, result and expository writing on the field of digital art and design. It also has to have the originality in its concepts, methods, expression techniques and making process, and the result should have some values which can be shared with ADADA members or the people who study digital art and design.
Number of pages: 6 -10

Original Paper

International Journal of Asia Digital Art & Design

A study of Integrated research process

Between design and social science research

Kim, Ji Hyun
KGIT media design
Pk5603@gmail.com

Kim, Hong Jin
KGIT media business
kinghj06@gmail.com

Jung, Hoe Kyung
KGIT Newmedia Division
hkjung@kgit.ac.kr

Lee, Joung Youn
KGIT Newmedia Division
jylee@kgit.ac.kr

Abstract

For creative ideas and problem-solving, various methodologies are used in the field of design and social sciences. Design methodology includes a variety of ways to come to a solution prototype through qualitative surveys of users. Meanwhile, in the field of social sciences, a quantitative and larger scope user survey is used to verify suggested solutions or analyze the issues of social phenomena. In order to complete the problem-solving process through planning and analysis, there is a need to combine these two methodologies. This study compiled usable methodologies by analyzing theses in the field of design and social sciences and establishing meta data in order to develop and suggest a more integrated methodology. By taking into account the stages and methods where each methodology has strength, a five stage research methodology is suggested, PAIRS , that consists of Phenomena-Analysis-Ideation-Review-Supply. In the stages of Phenomena, Ideation and Supply, design methodology can be used effectively, while in the stages of Analysis and Review, methodologies of social sciences with more analytical components can be used. This is expected to allow the use of various methodologies depending on the purpose and stage in the research and development of products and services in both design and social sciences. By doing so, it is expected that it will contribute to the conclusion of insights and suggestions of innovative solutions.

1. Introduction

1.1 Purpose of the research

In the area of design and social science, many different methods to increase creativity are being researched and are used in many ways for service researches. These methods are creating social revolution in many companies and labs and its importance is being recognized from its results.

The methods are developing by trends and the boundary of the researches that apply these chaning methods are expanding. It is defending the fact that the importance of using methods that are out of the boundary is expanding.

It is said that the importance about integrated methodologies which was re-interpreted and re-created grow with the introduction of methodologies in other areas. New methodologies have been developed and utilized consistently but there are no platform which classifies them systemically. In terms of utilization and effectiveness of methodologies, they are applicated in diverse areas but there are only few of in-depth researches.

Therefore, this research has the follow purposes.

First, design and social science methodologies are structuralized with purpose, utilization, and meta-data. It was prepared as per cause and type for user to use appropriate methodologies.

Second, we understand and analysis the strength and weaknesses of the methods between design and social science; categorizing and systemizing them, helping to develop integrated methodologies.

1.2 Research Process

1) Design, social science methodologies collection

The methodologies used in advertisement, media, management, cognitive psychology, cognitive engineering, HCI, human psychology related to design, and social science are collected through online and off-line articles, journals, and books.

2) Design, social science methodologies integration and classification.

Classify, systemization and arrangement of design and social science area as a similar category. Understand the features of methodologies in both areas and analyze strength and weaknesses by re-organizing analyzed data and constructing

meta-data based on utilization.

3) Suggest integrated process

Analyze the methodologies, which are used regularly in internal and external dissertation used in companies. By integrating and analyzing methodologies of design and social science, develop and propose the process that emphasize phased strength of each process.

2. Previous works

2.1 Structuring meta-data

Generally, meta-data called "the data about data" is designed as the tool to describe digital resources effectively. This term was used to be made by computer engineers and the data-base area, but the fundamental concept about Meta data has been in the library after the first-attempt to organize and describe the information.

With the stream of time, as the information type which is available to use online diversifies, meta-data schema form is made to describe and manage digital information-resources by defining a series of factors.

(1) Meta data has to inform and express resources. This is usually described by the characteristics of the information resources.
(2) Meta data has to provide specific information resources or contents.
(3) Meta data should be able to handle all types of information resources.
(4) Meta data should be the structured to handle machine-understandable information .

In this research, by collecting and categorizing the methodologies of researches related to new-media through the journals, construct the close relations of each category

Classify the meta-data of design and social science & management methodologies to make the correlation

Re-organize the Classified meta-data, to make it easier for the users, through cord-sorting that makes it systemical and definite in structure in storing the form which can be processed easily.

2.2 Design methodology

1) Service design methodology

Service design methodology starts from approaching the problem. The deduced problem on the base of analysis of surveys can write down scenarios in the beginning of the design-process. With priority given to the scenario drawn up, we can approach the point of contact to solving problems by using the blue-print service and customer journey map or persona, etc. As the service design builds up with experience, the key-value of design service does not search the cause of the superficial activity and mind, but draws the factors of the problem through experience in living an environment of space like the blue-print service and customer journey map or persona as service design methodology.

Also, the factor of experience must go through the process of changing the knowledge and analyzing of results of the direct and indirect experience. This composes the reappearance of the knowledge of participants.
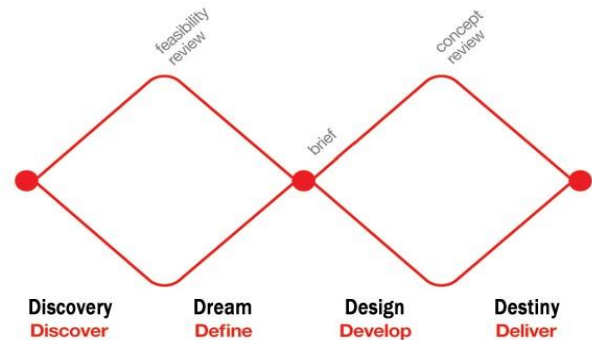
This model have 4 steps as below;

Figure 1 Service design methodology

The stage 'Discover' involves observation & collection. The goal of this stage is to select the research theme and to understand the present state and problem through the user's observation.

The stage 'Define' is the process of finding the problem. The goal of this stage is to find the state of the problem and to draw the design with data, which are explained from previous stage.

The stage 'Develop' consists of the development of product and service. The goal of this stage is developing product/ service concept through the concretion of idea.

The stage 'Deliver' is the final procedure. The goal of this stage is to announce the final decision about product and service, sharing mutually.

2) IDEO

Because of IDEO Company uses a process which is very famous for innovation and integration, we selected one of benchmarking case. The process of IDEO is as in the
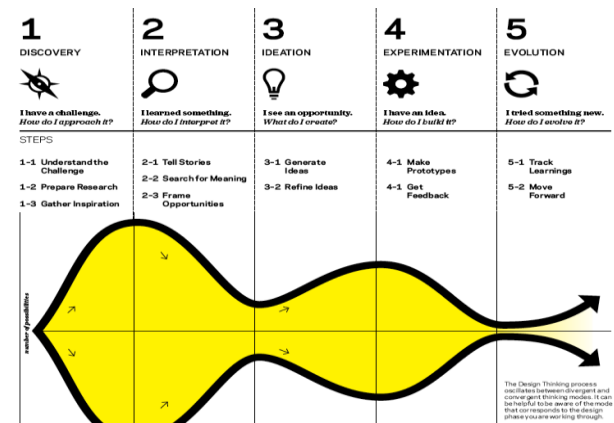

Figure 2 The five phases of the design process

following;

(1) Inspiration: The stage of people's idea.
(2) Concepting: The stage of mapping the best idea which would get sympathy of many people among the ideas.
(3) Refinement: stage of designing the idea concretely
(4) Evaluation: Stage of evaluation of users

(5) Winner Announced: Stage of selecting the final conception.

The features of IDEO methodology is the following.

First, the collaboration of participants who have diverse background each decides time frame in the dedicated space. Second, through the observation, research about the users. Third. Through the synthesis, find the opportunity.

Since the process of diverse participant's collaboration involves, not simply designers, but also people of other areas, it has steps and methods suitable for both people. It is also researched as the form of creative work shop.

2.3 Social science methodology

Grasping the problem	Analysis of problem	Verification of secondary data
-Identifying Problem -Setting the problem of research -Setting theory	-Setting the Variable -Collecting data -Analyzing data	-Analyzing factors -Correlation of theory

Figure 1 Social science methodology

The social scientific methodology consists of the stage ' grasping the problem', 'analysis of problem', verification of secondary data'.

In the stage ' grasping the problem', first, observe the issue and phenomenon. Second, question and doubt. Third, set up the research problem and set the hypothesis after assorting diverse thought about problem. Research method, one of the process in social science, is the key role. It finds out and sets the independent, dependent, and experimental variable from the hypothesis in way of social science research.

The way of social science research is composed of two courses, 'collecting data', and 'analyzing data.'

In the stage 'collecting data', researchers make the research design suited for the theme of research and set up the object of the study. Finally, they collect the information with priority given to them.

In the stage 'analyzing data', researchers analyze the collected data with diverse statistics programs.

The ways to collecting data consist of ways to investigate and way to analyze called statistics. There is the step of verification for understanding the reliability, validity, and correlation. Through this, we have significance for processing objective and factual researches.

2.4 Business Model Development Process

According to [8] , there are 4 procedures, which are 'business model plan', 'business model design', 'business model realization', and 'business model management.' In the stage 'plan'. we analyze the environment, requirement, business validity, and deducibility of the promising BM.

In the stage 'design', there are customer, business, and partner scenarios. In the stage 'realization', there are value mapping, process mapping, and platform mapping. Finally, in the stage 'management', there are profit administration, capability administration, and risk administration.

BM Plan	BM Design	BM Implementation	BM Operating
-Analyzing environment -Analyzing requirement -Analyzing business validity -Deduce the promising BM	-Customer scenarios -Business scenarios -Partner scenarios	- Value maping - Process maping - Platform maping	- Revenue management - Competence management - Risk management

Figure 2. 4 steps of procedures and activities for designing business model

3. Analysis of methodology with meta-data

3.1 Categorization of meta-data

The collected data is divided largely by methodology and it is classified based on the features of methodology, which is used in each methodology centrally. We prepare the guide by target and media. We classify the methodologies by the features of technique to facilitate approach of course and application.

Purpose and example of each classification are tabled as follows.

Table 1 Classification Meta-data by purpose

Metadata	Purpose / *Examples*
Methodology	The concrete explanation of the methodologies and classification of subordinate methods for organizing archiving *Service Design process / Interaction Design / User Experience Design / Emotiinal Design*
Method	The concrete explanation of the methodologies and classification of subordinate methods for organizing archiving *Touch Point Matrix / Mind Mapping / Persona / Interview / Blue Print / Affinity Diagram*
Design Process	The easy approach on method at each stage and the comparison of similar method *1) Discover: Related to surveying for collecting information.* *2) Define: Analysis of Information, definition of problem* *3) Develop: Developing an idea, a way to draw the service conception.* *4) Deliver: Way to develop and practice service proto-type.*
Target	We understand suitable Methodology Classified by target of research and help to applicate *Environment, company, person*
Qualitative/ Quantitative	By the features of the quantitative, qualitative surveys, we can analogy the procedures of each methodology which draw a conclusion. We also understand relationship with the subject
Media	We make the target of research classified by the media, we can select the suitable methodology as per the kind of media. *Cloud system, internet, IP TV, mobile, online, Sns, smart phone, smart media*
Standard of analysis	It helps to discern the suitable method depending on the type of research *Activity, attitude*
Creativity	It shows the method is involved in creative design area, another area or original area. *Innovation, application, tradition*
Aptitude	It is classified by the chief aim.; beginning exploration, concept development, experimentation, assessment *Exploration, production, assessment*

34

3.2 Analysis of meta-data

1) Results of analyze of design methodologies

In the area of design, we analyze literatures and websites which have keywords of design methods or process; domestic 150, foreign 150, and company ; domestic 10, foreign 10

Table 2 Results of analyze of design methodologies

	Domestic	International
Methodo logy	Emotional design process, emotional evaluation / context design process/ Interactive design process/ Interaction design process Service design process/ User participation design/ User experience design/ PSS design process/ IDEO design process/ Value design process Product service integration design process Business model developing process	Design cognition / UX Design Process / Design Theory / Information Seeking / Observation / Interaction Design / Service Design Process / Service Task Analysis / Toolkit / Workshop / Digital Humanities/ Modeling The Design Dialogue Framework /design process (first-user-study-then-de sign) / Collaborative Design / Card-based toolkit / Activity Theory
Methods	Brain storming/ emotional area image map/ observation/ interview/ Modeling/ persona/ storyboard/ proto-typing/ scenario/ focus group inter -view/ mental-model / creative workshop/ context mapping/ emotional experience exploring drama/ brand touch point wheel/heuristic evaluation/ value design space/ design function/ target segment analysis/ User Model /	Epistemology / Data Analysis / Observations / Discussion / scenario based design approach / Action function Diagram / Affordance Evaluation Method / Ethnomethodology and Conversation Analysis / Ethnography / Mobile ethnography / Data Collecting & Categorizing Shadowing / Mapping, Interviews / User Journals, or Observation
Target	- Environment: 28% - Company: 52% - User/Customer: 20%	-Company: 56%
	- Quantitative: 30% - Qualitative: 70%	- Quantitative: 40% - Qualitative: 60%

The analysis of the meta-data related to design-methodology is as in the following.

Table 3 Meta-data related to design-methodology

Domestic Researches	• Using on diverse methodologies related to Creating idea, developing product, delivering • Putting on diverse methodologies which can understand specific and diverse user's need. • Putting on methodologies which is useful for expanding idea with the coincidental and dramatic features in design methodology.
International Researches	• Through the co-work, propose the methodology which can share variably by making participation higher. • Through the visualization, propose the efficient way of tool which can analysis the problem in the general viewpoint. • Propose the method of mainly relationship analysis, which include all people concerned
Domestic Enterprises	• Understanding the example of the process and methods used in practical business. • Showing the strength in giving the efficient service- experience through practical and specific analysis. • Availability to analyze developed-examples which applicate diverse methodologies in a new way.
International Enterprises	• Processing new and lasting trials through developing creative methodologies • Keeping the unique principle and methodology of each company. • Through the co-worker, enforce the methodology which can make the creativities.

2) Results of analyze of social science methodology

The analysis of the meta-data related to design-methodology is as in the following. In social science area, we analyze the researches, domestic 150, foreign 150,

Table 4 Results of analyze of social science methodology

	Domestic	International
Method ology	Interview Survey Experiment Content analysis Case study Literature study Participant – observation, Accident research methodology,	Interview Survey Experiment Content analysis Case study Literature study Participant – observation,
Method	APT laddering, pilot test, snowball sampling, Group simulator, Idea simulator Direct writing - survey, off line survey, on-line survey, mobile - survey, invitation - survey, chatting interview, focus group interview, big data analysis, News letter analysis, line network measurement, example	Discourse Analysis, Virtual ethnography. The Transcultural Approach, Experimental simulation, Self- report measures, Online survey, Mail survey, Group administered questionnaire, Focus group interview,

	research, term study, eye - tracker, conjoint – analysis MMPI, drawing a person test, ego-value examination,	Qualitative content analysis,
Target	-Environment: 26.45% -Company: 40% -User/Customer: 33.54%	-Environment: 37.50% -Company: 31.25% -User/Customer: 31.25%
	- Quantitative: 88.38% - Qualitative: 5.16% - quan/ qual: 9.67%	- Quantitative: 81.25% - Qualitative: 6.25% - Quan/qual: 12.5%

The analysis of the meta-data related to social science-methodology is as in the following.

Table 5 Meta-data related to social science-methodology

Domestic	• Even if the area of research is different, the methods are same • We can find the methodology for collecting quantitative data is the representative • Rather than environment analysis, the researches about the technique of company, person or person as the users are the most • We can find the methodologies which are borrowed from other areas. E.g) Delphi, q methodologies e.t.c
International	• Use the methodologies centered on research • For collecting quantitative data, methodologies are used mostly. • Use the methodologies which analyze the features and information of users.

4. Propose the integrated process

4.1 Analysis and integration of the existing process

We collect the data from each process. We also visualize the explanation and collection of the information on the sequence of process. We analyze the point of contact and long distance. We visualize and analyze IDEO, which is the representative of company, service design process, which is most used process in social science and business model process in management.
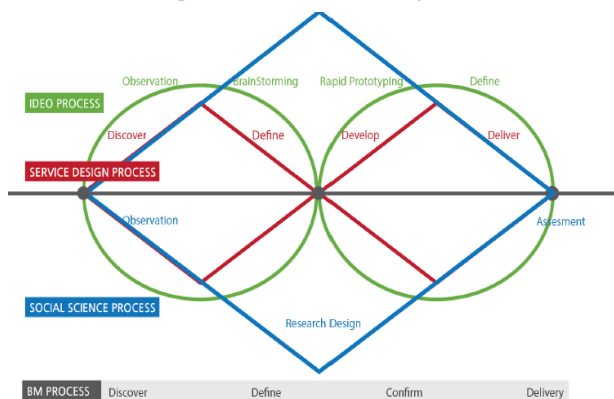
The visualized picture is in the following.

Figure 5 Visualizing the stage of process

It is verified that the result of visualizing the stage of

process, there are 5 points of contact or long distance.

After analyzing the features of the stage, the first and last points are formed as the point of 4 contacts. All processes have the same repetition of expansion and collection.

Based on the visualized data, there are 5 stages and we can show that each strength is in different space by the process of each area.

Especially, we analyze the service design and the features of social science, select the concept suitable for developing integrated process, and propose the diverse in an efficient way according to the purpose of user.

Figure 6 Affinity Diagram for concept

4.2 PAIRS PROCESS

We visualize the process of each stage, analyze the feature, strength and weak points of design and social science. There are definite difference in purposes of each field; in the design methodologies, most features are centralized on intangible data which are produced by user's experiences, emotions, and needs. But in social science methodologies, the features are centralized only on objective verification of data.

In design methods, the strengths are the release of diversity ideas throughout the design research and prototype technologies. More user related output can be approached. However, the standard of second materials by design research and methodology, is ambiguous, not quantitative. That is why in design field, there is a deficit of digitalization of the objective researches. In the social science and management, there are professional objective.

After identifying each process' strength and weaknesses to each stage properly, strong points are emphasized and weak points are complemented. And finally new integrated process are suggested by recombination of the existing processes. To accomplish this process, design service process is used, and based on this structure we are providing a new integrated process which is able to define the problem clearly with providing solid data. I is also able to provide innovative alternative suggestion with objective evaluations.

The step is divided into five parts as the following attribute-centric. The first step in the process is discovering the problem, and the second is identifying the specific problem definition and process of organizing. The third step is to approach the solution for the problem in the study and fourth is to evaluate credibility and validity against a high check. Finally, output is delivered to users as a practical step.

By focusing on these, attributes fit into each steps of the emitting and ideas brainstorming, using most appropriate concept and definition for each step. As a result, integration between design and social sciences is the best in intentions, exposed side-by-side. "P A I R S" the name of the process. The goal for each of the stages and are as follows:

The "PAIRS "process whole 5 definite steps as below.

Table 6 5 steps of PAIRS process

Phenomena	Through desk research and observation of users/environment, collecting problems and watching phenomena. *- Fact finding* *- Diagnosis status* *- Understanding stakeholders/ environment*
Analysis	Based on collecting data, understand the key problem and define the people concerned. *- Redefine the problem* *- Arrange the need* *- Analysis relationships between data*
Ideation	Through the actualization, developing solution, business model, service. *- Explore the latent problems.* *- Actualization key ideas by prototyping*
Review	Through Variable test and survey in social science, we analyze and evaluate the suggested idea *- Improvement with modelling verification, assessment*
Supply	Through visualization and production of concept, scenario, make the product of the project *- Disambiguation of product* *- Confirmation of the accord of plan, service design and development*

Figure 3 PAIRS process figure

The main concept of this new "PAIRS" process is as in the following.

Table 7 Concept of PAIRS process

Identity	• As the key information and method are suggested, users can select & use them to their needs at each stage. • Based on definite verifications, we can use properly when we need service-proposal.
Difference	• We inject the 4 stage process of design and propose methodologies which can put objective data at the same time. • Through the definite analysis & verification, • We check the status-quo, understand usability and do understand, improvement usefully.
Expandability	• Availability to applicate the process in the diverse area • With the combination of lines methods, we can create new integrated processes.

We arrange each method we think is the strength of design & social science methodology to each stage properly in the PAIRS process. Pairs process is the recombination of the existing processes.

In the stage 'PHENOMENA', 'IDEATION', and 'SUPPLY', there are methods which originate from design area as the strength. In the stage 'ANALYSIS' and 'REVIEW' there are method which have the strength of analysis.

We supplement the weaknesses in both area and propose this complementary process.

5. Conclusion

This research aims to suggest an integrated study/research process between design and social science and our research process is as below;

First we made the data base by searching, classifying and systemizing methodologies from the design and social science research field. Through diverse literature materials, we collect and systemize the methodologies and categorize them by source, concept, stage, target, and department of application. We help the usability and availability of method & methodology.

Second, we apprehend the features of methodology in design & social science and propose the guide-line which was systematized to use properly as per purpose & stage. In the area of design & social science, we borrow the methodology from diverse area depending on purpose, company, and environment for variable research & development. And we help to integrate methodologies among another.

Third, we draw the conception of archiving platform suitable for user and design the creative platform. So we give user experience of the satisfactory integrated archiving.

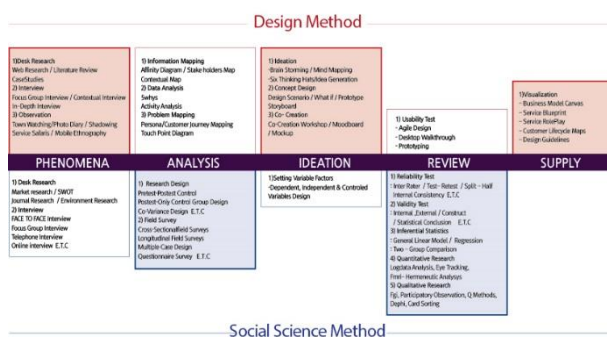First, through the systematization of design & social scientific

methodology, we can separate and use the stage depending on the purpose of research and the concrete needs of users. So we applicate it fast and systemically.

Second, we borrow design & social science methodology from company & society. Based on methodologies of both area, We deduce the new insight and help innovative plan & development

Third, through the archiving platform for user, consistently we can collect and categorize data about the design-methodology. With the methodologies from platform, we can make methodology suit for lectures about new-media and will construct the innovative KGIT integrated methodology.

References

[1] Lee, M., Park, N. (2003). A Study on the Product-Service Design Method of the User Experience Design Perspective, *Archives of Design Research, 26*(2), 1-27

[2] Kim, C., Nah, K. (2012). A Study on the Utilization of Open Innovation Platform for Co-creation as Service Design Methodology-Focused on the Case Study of 'OpenIDEO' and 'Quirky', *Journal of Digital Design, 13*(1). 1-10

[3] Park,J. (2013). Creative Thinking Tools and Their Application to UX Design, *Archives of Design Research*, *26*(3). 1-23.

[4] Lee, T., Shin, K. (2011). Scenario-based Experiential Ideation Toolkit for Creative UI Development, *Journal of Korean Society of Design Science*, *24*(4). 1-11.

[5] Kim, S. (2013). The Development of Design Methodology as a Tool for Developing Business Opportunity and Realizing Innovation - Case Study of Global Company and Global Design Agency, *Journalism of digital design*, *13*(2). 103-116.

[6] Bae, j. (2013). A Suggestion of Collecting and Recycling Systems of Home Appliances for Invigoration of Urban Mining Industry – Mainly, with Service Design Methodology, *Journal of digital design*, *13*(3). 245-254.

[7] Yoon,S. (2013). *Service design, re-design the service design*, Service design & digital convergence Team at KIDP.

[8] Im, C. (2004).   IT New technic business model development methodology research, *2004 korean institute of industrial enginners spring symposium*, 369-376

[9] Leavy, P. (2011). *Essentials of transdisciplinary research: Using problem-centered methodologies* (Vol. 6). Left Coast Press.

International
Journal of
Asia Digital
Art & Design

Identification of The Character Figures Visual Style in Wayang Beber of Pacitan Painting

Grahita, Banung.
Tokyo Metropolitan University
banung-grahita@ed.tmu.ac.jp

Komma, Toshihiro.
Tokyo Metropolitan University
komma@tmu.ac.jp

Abstract

This paper describes a transformation of wayang beber of Pacitan character figures visual style and identification of its features. Wayang beber is one of wayang forms; it is a traditional theater art that originated on Indonesian island of Java. It uses series of painted scroll as storytelling medium. Wayang beber is rare form of wayang, today it only could be found in Pacitan city, in east Java, and Wonosari in Yogyakarta. Wayang beber found in Pacitan called wayang beber of Pacitan. Wayang beber of Pacitan has distinct visual style to depict human figure. This visual style is one of pinnacle of Javanese artistic tradition that has strong influence within Javanese society. It is a part of traditional artistic knowledge that should be preserved and developed. The main problem for preservation is a lack of visual and textual documentation. Our research on this paper is focusing on a study of the visual style of wayang beber of Pacitan character figures. The purpose is to compile an artistic knowledge for preserving wayang beber tradition. We traced the origin of the visual style, and identified the distinguishable features. As a result, we found four important features on the visual style; those are stylized shape, distorted proportion, outline drawing, and polychromatic color.

Keywords: wayang beber of Pacitan history, wayang beber of Pacitan visual style, Indonesian cultural heritage

1 Introduction

Wayang is an Indonesian traditional theatre art that originated on Indonesia Island of Java. Wayang has many forms; one of them is wayang beber. Wayang beber uses series of painted scroll as medium. Only two sets of wayang beber could be found today. The first one is kept in city of Pacitan, in East Java, and the second one is kept in Wonosari, Yogyakarta. The first one now is known as wayang beber of Pacitan (see Fig.1) and the second one known as wayang beber of Wonosari. Wayang beber initially use in a traditional ceremony to pray for safety and prosperous in life [1]. For this reason, wayang beber considered as a sacred relic by the local community.

In 2003, wayang was recognized by the UNESCO as Masterpiece of Oral and Intangible Cultural Heritage of Humanity. By this recognition, wayang need to be safeguarded. According to UNESCO [2] the importance of intangible cultural heritage is on the wealth of knowledge and skills that is transmitted through it. In the case of wayang, it consists of multidimensional knowledge including knowledge of visual arts and crafts [3]. Our paper discusses this knowledge of visual art and craft behind wayang beber, especially wayang beber of Pacitan.

Wayang beber of Pacitan and wayang beber of Wonosari, both have a distinctive visual style to depict human figures. This visual style could be seen as one of pinnacle of Javanese artistic tradition. Research by Nuning Adisasmito [4] found that the visual style of wayang beber has strong influence for Javanese illustration in 19th century. It also inspires some

Indonesian visual artists today, such as Wayang Beber Metropolitan Community in Jakarta, and an artist named Dani Iswardana from Surakarta, Indonesia. They not only use wayang beber as media for their work, but they adopt its visual style as well.

Visual style is a distinguishable ensemble of visual characteristics, qualities, or expression in the work of art [5]. The visual style of wayang beber of Pacitan could become a valuable artistic knowledge for the development of Indonesian art. However the main problem is lack of documentation. Until now, only few researches dedicate research on wayang beber, especially on the visual aspect. As a consequence the existence of wayang beber of Pacitan is in danger. Not only the

Figure1. Wayang beber of Pacitan scroll

knowledge but also the artefact of wayang beber of Pacitan will be lost, since the condition of its original painting now is very poor.

To preserve wayang beber of Pacitan, we make a project to design a digital documentation and promote wayang beber of Pacitan. This paper explains a chapter of the project which tries to extract the artistic knowledge behind wayang beber of Pacitan, especially related to the visual style of its figures.

This paper consists of two parts. In the first part we traced origin of the visual style of wayang beber of Pacitan figure, and studied its transformation. In the second part we analyzed distinguishable features of the visual style as the result of the transformation.

2 Origin and Transformation of wayang beber of Pacitan figure visual style

The story spread within the Pacitan locals, as explained by Warto [1], said that wayang beber of Pacitan was inherited from Majapahit Kingdom era around 14th century in Java. Wayang beber of Pacitan paintings were given to Nala Derma, the first wayang beber performer from Pacitan as a gift for healing the Majapahit princess. Then the paintings were inherited from one generation of performer to the next in Pacitan.

However we see a contradiction between this story and the style of wayang beber of Pacitan figures. We studied the wayang beber of Pacitan figures and compared it with another type of wayang that called wayang *kulit purwa*. Wayang *kulit purwa* is the most popular type of wayang in Indonesia, many researches and documentation could be found related to this type of wayang. We found that the figures in wayang beber of Pacitan and wayang *kulit purwa* have very similar appearance. A paper written by Koesoemadinata explained that the appearance of wayang *kulit purwa* figure was begun in Islamic period in Java [3]. It was a result of Islamic values inclusion into the wayang art. Therefore we oppose that wayang beber of Pacitan was made at Majapahit Kingdom era. Majapahit was a Hindu kingdom that ruled Java before Islamic period. Wayang was made under the patronage of reigning monarch, so that wayang figures that was influenced by Islamic values wouldn`t made under the Hindu patron.

Nevertheless several literatures infer there is a wayang beber painting that was made within Hindu period of Majapahit. The painting was painted by the son of Majapahit King, Brawijaya in 1378 AD [6]. The existence of this wayang beber painting also written in a record made by Ma Huan, a Chinese voyager whose visited Java in year 1416 AD [7]. He said that in that era wayang beber was used in some rituals.

Regarding this matter, we concur with Primadi Tabrani [8]. In his dissertation, he explained that wayang beber painting that was made in Majapahit era was not wayang beber that we know as wayang beber of Pacitan today. He referred to Sayid, a wayang performer and expert, who described that wayang figure in Majapahit era, was more realistic.

However, wayang beber of Majapahit era is thought to have vanished, so that we can`t compare its figure style with wayang beber of Pacitan. Even then, we still could observe the

Figure2. Relief of Panataran temple

Figure3. Wayang *kulit* of Bali

style of wayang figure from Hindu era by looking at other types of wayang such wayang *batu* of Panataran temple or wayang *kulit* of Bali.

Wayang *batu* is a wayang carved on stone which could found on relief of Hindu temple of Panataran in East Java (see Fig.2). It was made at 11th century before Majapahit era. Wayang *kulit* of Bali is wayang made of leather that could be found in Bali Island (see Fig.3). Until now Bali has strong Hindu tradition. In contrast to Java, Bali never been influenced by Islam. Therefore wayang kulit of Bali hasn`t changed as happened on Java.

We found that figures in wayang *batu* of Panataran and wayang *kulit* of Bali have typical features. The figures are depicted from the side. Although the shape has been simplified, their proportions still resemble a real human figure. The figures are not as thin as the figure on wayang beber of Pacitan. We infer that the wayang beber of Majapahit era has these typical features; so, it is different with wayang beber of Pacitan.

The connection between wayang beber of Majapahit and wayang beber of Pacitan could be found in paper by Tabrani [8] and, Mulyono [9]. In both papers, they explained when the first Islamic Kingdom of Java conquered Majapahit, all relics including wayang beber are taken. The possession of relic is seen as symbol of domination.

Figure4. Wayang kulit purwa puppet

Figure5. Wayang kulit purwaperformance

In that era, wayang was an important a part of Javanese people life who still follows Hindu religion. The king and religious leader of Demak modified wayang and used it as tools for spreading Islam. Modification of wayang form was done to follow Islamic view wich forbids a real depiction of human figure. The entire figure was more simplified and depicted from the side. Instead of painted it on one piece of paper, wayang figures were separated one by one. The figure was made into a flat puppet using leather. This type of wayang then is known as wayang *kulit* (see Fig.4). Wayang kulit keep on improved, the wayang *kulit purwa* form that known today was appeared around year 1613-1645 AD in the era of Islamic Kingdom of Mataram [10]. According to this explanation, we conclude that the shift of religion within the society affects the visual style of wayang figure in Java. Wayang's visual no longer portrayed human figure, it is now symbolize human personality [11]. The shape of wayang's body and attributes is considered as a symbol that describes the personality of the wayang character.

We also figured that the transformation of wayang figure shape is also caused by the change of wayang form, from a painted scroll to a puppet. Wayang *kulit purwa* puppet has very distinct shape. It has a big head, long neck, wide shoulder and long thin arm. Entire body of the puppet is carved by a complex pattern. The reason behind this shape could be related to a necessity of wayang *kulit* performance. Sukasman, a wayang performer and maker has interpreted the shape of wayang *kulit* puppet [12]. He explains that in the wayang *kulit* performance, the shape of the puppet must be able to be identified easily by the audiences. The thin and distorted puppet's body will help this identification. The long neck will make the head of wayang could be seen easily from a distance. The wide shoulder and long arm is necessary so that the wayang puppet's arms could be easily moved. Moreover, wayang kulit is perform behind a screen, lit by light; most of the audience only see shadow of the puppet (see Fig.5). The carved pattern make the shadow looks more artistic and it helps audience to identify the wayang character.

Figure6. Wayang beber of Pacitan figures

We reckon that the shape of wayang *kulit purwa* puppets become a prototype for later development of wayang art. It then becomes a visual style for wayang figure in later period, including wayang beber of Pacitan. We referred to scholar like Salim [13] and Tabrani that estimate wayang beber of Pacitan made after wayang kulit. They argue that visual style of the figure on wayang beber of Pacitan painting imitates the shape of wayang *kulit purwa* puppet (see Fig.6). Another explanation could support this argument. According to Sudrajat [6] there is a way to find out the production year of the wayang beber of Pacitan painting. Traditional wayang painting always has certain pictures symbolize the production year. Sudrajat explain the symbol in wayang beber of Pacitan painting could be interpreted as 1614 (Javanese year) or 1692 AD. So, referring to the visual style and the symbol of production year, we believe that wayang beber of Pacitan estimated made around 1692 AD within Islamic Kingdom of Kartasura era in Kartasura city, Central Java. So, how wayang beber could be found in Pacitan, a small city in East Java?

Regarding this matter, Tabrani, referring to Sayid, relate it to the rebellion at Kartasura palace in 1742 AD. When the king was evacuated from the Palace at Kartasura city in Central Java to Ponorogo in East Java, they brought all the relics including wayang beber. There was a possibility that wayang beber was left behind in Pacitan which is locate between Kartasura and Ponorogo [8].

Based on these literatures we conclude that wayang beber of Pacitan came from a period after wayang kulit purwa. Its visual style is derived from the shape of wayang kulit purwa puppets. For the transformation timeline see Fig.7.
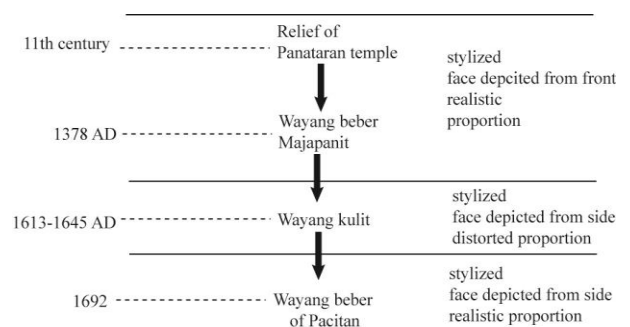

Figure7. Wayang transformation time line

3 Distinguishable Features of The Character Figures Visual Style in Wayang Beber of Pacitan

To analyze visual style of wayang beber of pacitan figure, we referred to Primadi Tabrani's theory of visual language [14]. Based on this theory, a visual style could be described by analyze the visual elements, such as lines, colors, shape, etc., which are used to form an image. Tabrani has categorized several ways to use visual elements, and we identified four ways are applied to draw Wayang beber of Pacitan figure, those are:

1. outline drawing
2. polychromatic color
3. distorted proportion
4. stylized depiction

3.1 Outline Drawing

Outline drawing emphasizes the use of line to form a shape. It focuses on clarity of the picture to convey a message rather than resemblance to reality. We found that the lines of wayang beber of Pacitan figure are single and expressive. They are clear, continuous, wiggly, and has variation of thickness. There are two kinds of lines, thick lines which used for the outline and thinner lines which used to depict detail of the figure, such body hair, skin wrinkles, or fold of cloth (see Fig.8). The lines have various colors depend on the color of the figures.
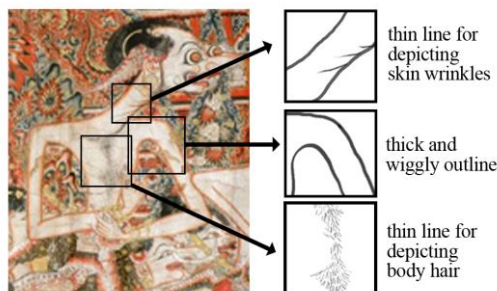

Figure8. Lines features in wayang beber of Pacitan figure

3.2 Polychromatic Color.

Polychromatic color means that wayang beber of Pacitan figure consist colors with different hue. We identified five color hues in the figures, such as red, green, yellow, white, and black. Each color is used in several values, as instance there are pure red, light red and dark red. All colors are solid, they have no gradation. The transition from light color to dark is made by stacking color one upon another. The unique color feature of wayang beber of Pacitan figure is resulting by a specific Javanese traditional coloring procedure that called *sungging*. In this procedure colors are added in specific order, it started with the light color and followed by darker color.

Sukir [15] explained there are three types of coloring in this traditional procedure (see Fig.9), they are:

· Basic color, this coloring uses only one solid color. We found this coloring in the most of wayang beber of Pacitan figures.

· Layered Color, this coloring is used to make gradient by piling up the color. We found this coloring on the cloth and tree images.

· Multiple Layered Colors, this type of coloring is used more than one layered color in one image; we found this coloring on the cloth images of wayang beber of Pacitan figures.
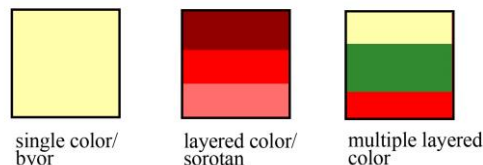

Figure9. Color feature in wayang beber of Pacitan figure

Sungging is not just about procedure for adding color. It is also followed by a process to add pattern to certain area of the painting. Usually it was added to a wide area that colored by basic color. We identified the pattern in wayang beber of Pacitan figure's clothes. There are two kinds of patterns are used. First is floral pattern. This pattern is used to portray Javanese traditional cloth called *batik*; it is a typical clothes that worn by Javanese. The second one is a thin line pattern. It is used to fill up figure's clothes which not covered by floral pattern. *Sungging* is ended by a process of drawing lines to fix the shape and adds the details of the figure.

We consider that the whole sungging procedure gives wayang beber of Pacitan figure distinct visual features.

3.3 Distorted proportion

Wayang beber of Pacitan figures have a distinct shape. It has big head, long neck, and wide shoulder. The arms are longer than the legs. In term of visual language theory it called distorted depiction. This shape is derived from wayang kulit purwa puppet. As explain in chapter 2, the shape is caused by necessity of wayang kulit purwa performance.

One distinguishable feature of the figure shape is the head which is placed forward (see Fig.10). According to Sukasman, the purpose is so that when two figures are shown against each other, they seem to communicate [12].

However we found that figures shape of wayang beber of Pacitan has differences with the wayang kulit puppets. First, wayang beber of Pacitan figures seem taller and have more realistic proportion. Arms of wayang beber of Pacitan figures are shorter. Their hands position is above the knee, whereas the hand position of wayang kulit figures is below the knee. Shoulder of wayang kulit figures is wider; the right shoulder proportion is twice longer than the left shoulder. The right and the left shoulder proportion of wayang kulit beber of pacitan
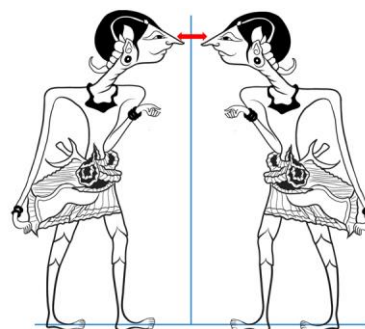

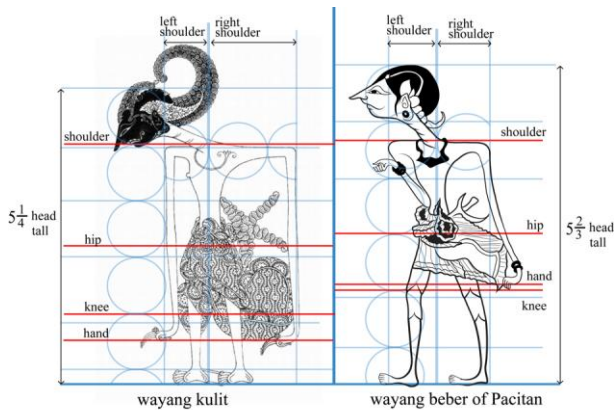**Figure10.** Two figures of wayang shown against each other,

Figure11. Comparison of wayang kulit puppet and wayang beber of Pacitan figure

figures is more balanced (see Fig.11). The shape also has more curved contour, it shows a three-dimensional impression.

We believe this difference is caused by the change of wayang medium, from puppet to painted scroll. The shape of wayang beber of Pacitan figure is no longer limited by the necessity of puppet performance.

3.4 Stylized depiction

Stylized depiction shape of wayang beber of Pacitan figure was made to follow Islamic view that prohibited realistic depiction of human or animal.

Stylize is a depiction that portray an object according a particular formats, rather than realistic representation. In wayang beber of Pacitan figure, the formats include angle of depiction, size of depiction, and symbolic depiction.

3.4.1 Angle of Depiction

Basically, the figures in wayang beber of Pacitan painting are depicted from the side, but if they are observed more carefully, each body part of the figures could be seen depicted from various views (see Fig.12). It could be described as:

· The head, nose and mouth are depicted from side.
· The eye is depicted from front.
· The shoulder is depicted from front.
· The body torso is depicted side
· The arms and legs are depicted from side
· The feet are depicted from side and above

This way of depiction is called multiple views. Multiple views is a depiction of image as if seen from different directions, different distances, or different time in one picture [16].

As mentioned before, the visual style of wayang beber Pacitan figure is derived from wayang kulit puppet. In the performance, wayang kulit puppet is shown as a shadow or silhouette. In this case, the multiple view depiction is used so that the silhouette of puppet's body parts could be easily recognized. Every body part of human figure could be easily recognized from certain angle. As instance, a nose is easily recognized from the side, whereas eyes are easily recognized from the front.

3.4.2 Size of Depiction

In wayang beber of Pacitan painting all the figures are drawn completely from its head to toe. This is called full body depiction. It is a typical depiction of figures in Indonesian
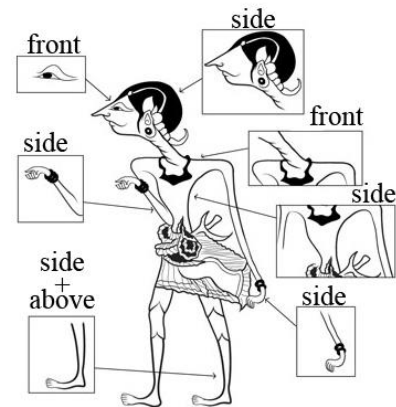

Figure12. Multiple views in wayang beber of Pacitan figure

traditional art. This kind of depiction could be seen in Panataran temple relief, wayang kulit puppet, and certainly in wayang beber of Pacitan painting. All figures in wayang beber of Pacitan painting are always drawn in same size. The figures those are close to viewer and the one that far from viewer have no different in size.

3.4.3 Symbolic Depiction

Wayang beber of Pacitan figures were made not to depict human physic, but to depict human personalities. The human personalities are symbolized by certain shape of wayang's body parts and attributes. To understand the symbols, we studied literatures of symbolism in wayang kulit purwa explained by Sayid [17], Purwadi [11], and Long [18]

Symbolized personalities in wayang kulit purwa could be known from its character types. According to Long, the character types are determined by the iconographic features of its figures. The most major determinant are body size which is consist of four major sizes, eye shape that include seven major types (see Fig.13), mouth shape that also has seven styles (see Fig.14), and tilt of head which consist of three kinds of position (see Fig.16). Another important features include stance, shape of nose (see Fig.15), and adornment.
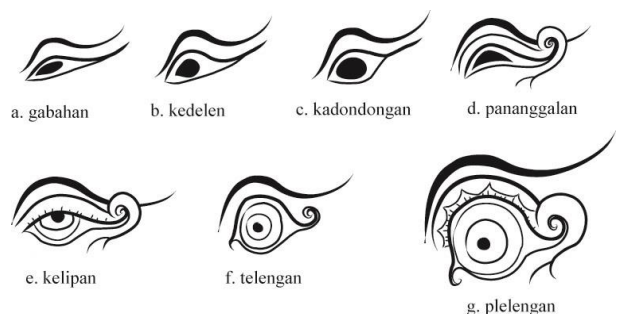

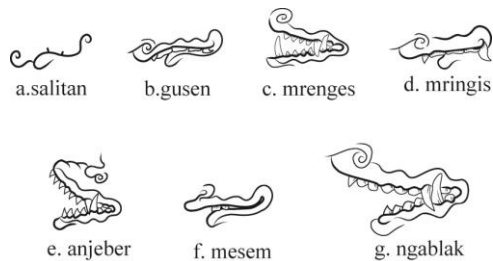**Figure13.** Types of wayang's eye shape

Figure14. Types of wayang's mouth shape

Figure15. Types of wayang's nose shape

Figure16. Types of wayang's tilt of head

In this paper, we categorized the characters of wayang beber of Pacitan based on body size, eye shape, types of mouth, nose shape, and tilt of the head. These features are used to determined character personalities. We excluded adornment which is used to determine status and social class of the character. We also exclude stance because it difficult to identify in wayang beber of Pacitan figures. The categorization of the important characters could be seen in table 1. The identification of characters' iconographic features in each group could be seen in table 2.

Table 1 Categorization of character in wayang beber of Pacitan

Group	Character Picture	Character Name
I		1. Dewi Sekartaji (female) 2. Jaka Kembang Kuning (male) 3. Sedahrama (male) 4. Retno Mindaka(female)
II		1. Gandarepa (male) 2. Ni Cona Coni (female) 3.Retno Tenggaron (female)
III		1. King of Kediri (male)
IV		1. Arya Jeksa Negara (male) 2. Kili Suci (female)
V		3. King Klana (male)

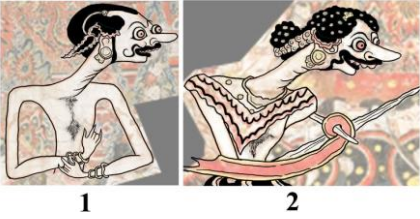| Group	Character Picture	Character Name
VI	1 2	1. Demang Kuning (male) 2. Kebo Lorodan (male)
VII	1	1. Tumenggung Cona Coni (male)
VIII	1 2	1. Naladerma (male) 2. Tawangalun (male)

Table 2 Iconographic features of figures in wayang beber of Pacitan

	Iconographic Features				
Group	Body Size	Eye Shape	Mouth shape	Nose shape	Tilt of Head
I	Small	gabahan	salitan	wali miring	luruh
II	Small	gabahan	salitan	wali miring	longok
III	Small	kedelen	salitan	Wali miring	luruh
IV	Small	kedelen	salitan	Wali miring	longok
V	Medium	telengan	salitan	benthulan	lanyap
VI	Big	telengan	gusen	pangotan	lanyap
VII	Medium (fat)	telengan	salitan	benthulan	longok
VIII	Small (fat)	kelipan	mesem	Bruton & terong glatik	longok & lanyap

Long also explain that wayang kulit characters could be classified into six types which are associated with specific personalities. The first types is identified as *alus* or refined character, which has reserve and polite personalities. The second types is identified as muscular or *gagah*, third type is grinning and muscular or called *gusen*, fourth type is ogre and giant character called *danawa*, fifth type is a simian character called *wanara*, and sixth is clown-servants character called *dhagelan*.

We applied this classification into wayang beber of Pacitan characters and found four classes of character. First, we classified the characters in group I, II, III, and IV as refined type. Main features that determined this type is the character's body size. The character has a smallest body among the six types. The body is slender and has a feminine appearance. Generally, refined character has suave and polite personality. This type is divided into two, the character with *gabahan* eye, and character with *kedelen* eye. Each of them

has two variations, character with *luruh* tilt of head, and character with *longok* tilt of head. Variation of eye shape and tilt of head signified degrees of refinement.

Character with *kedelen* eye has more aggressive personality than character with *gabahan* eye. Character with *longok* tilt of head is more aggressive than wayang with *luruh* type. Therefore, character with *gabahan* eye and *luruh* tilt of shape is the most refined character; follow by the character with *gabahan* eye and *longok* character, then the character with *kedelen* eye and *luruh* tilt of head. The character with *kedelen* eye and *longok* tilt of head is the most aggressive character in this class.

Second, we classified the characters in group V and VII as muscular type. Character in group VII has special distinguishable features. It has fat body shape and humped gesture that can't be found in any wayang kulit character. These features make the character difficult to categorize. However based on its general features such as medium body

size, and *salitan* mouth shape, we include this character in muscular type. The characters in this type are strong and have brave personality. The variation of tilt of head signified degrees of aggressiveness. *Lanyap* type is more aggressive than *longok*.

Third, we classified the characters in group VI as grinning and muscular type. This type has big muscular body, signified strong, rude, and aggressive character. Fourth, the characters in group VIII could be classified as clown-servant type. This type is the most diversified category. Each character in this type differs from another. However all clown-servant characters could be easy distinguished from other class of character. This class signifies various personalities

4 Conclusions

We have studied the history of wayang beber of Pacitan and traced origin of its figures visual style. We conclude that the visual style of wayang beber of Pacitan figures is a result of modification from previous types of wayang. The modification occurs because of two main factors. First factor is a cultural change in Javanese society. The inclusion of Islam religion has great impact to Javanese culture, including wayang art. It changes the values, function, and representation of the wayang. Second factor is the innovation in the wayang art. Wayang has developed from stone relief on the temple, to articulated leather puppet, and into sequences of scrolls pictures. This development brings changes not only to the performance technique but also to the visualization of wayang.

As an impact of cultural change and innovation, we identified four important features on visual style of wayang beber of Pacitan figures. Those features are outline drawing, polychromatic color, distorted proportion, and stylized depiction. Stylized depiction is an important feature that is inherited from wayang kulit purwa. It is caused by the implementation of Islamic values which is demanded symbolic depiction. This depiction divided the characters of wayang beber of Pacitan into four classes based on its personalities. Outline drawing, polychromatic color, and distorted proportion are the features that distinguish wayang beber of Pacitan from wayang kulit purwa figures. These features are result of transformation of wayang medium.

5 Future Works

In the next research, we will complete this documentation of wayang beber of Pacitan figures visual style with detail measurement for several attributes of the features such as numerical values of distorted proportion, and colors. We want to find the ratio of distorted proportion in wayang beber of Pacitan figures compared with real human proportion and also compile a chart for colors that used in wayang beber of Pacitan painting.

References

[1] Warto, *Wayang Beber Pacitan: Fungsi, Makna, dan Usaha Revitalisasi,*. Paramita: Historical Studies Journal, Vol.22, No.1, pp.56-68, 2012.

[2] http://www.unesco.org/culture/ich/index.php?lg=en&pg=00002, accessed 15 June 2014.

[3] Koesoemadinata, M. I. P., Sabana, S., and Adisasmito, N., *Socio-Historical and Cultural Influences on Visual Differentiation of Wayang Kulit of Cirebon, West Java, Indonesia: A Case Study of the Attributes Differentiation of Priest Drona Puppets.*Tawarikh Journal, Vol.5, No.1, pp.43-56, 2013

[4] Adisasmito, N. D., *Karakter Visual dan Gaya Ilustrasi Naskah Lama di Jawa Periode 1800-1920*, ITB Journal of Visual Art and Design, Vol. 2, No. 1, pp 64, 2008.

[5] Chen, Kuohsiang, and Charles L. O., *Form Language and Style Description,* Design studies, Vo. 18, No.3, 249-274, 1997.

[6] Sudrajat, U., *Wayang Beber Pacitan: Melangkah Menuju Beberologi, Jurnal Penelitian dan Pengembangan Kebudayaan,* Vol.5, No.1,pp 36-43, 2010

[7] Mulyono, S., *"Wayang; Asal Usul, Filsafat, dan Masa Depannya"*. Penerbit Alda, pp.159,1975.

[8] Tabrani, P., *"Meninjau Bahasa Rupa Wayang Beber Jaka Kembang Kuning dari Telaah Cara Wimba dan Tata Ungkapan Bahasa Rupa Media Rupa Rungu Dwimatra Statis Modern dalam Hubungannya dengan Bahasa Rupa Gambar Prasejarah, Primitif, Gambar Anak dan Relief Cerita Lalita Vistara Borobudur"*, Dissertation, pp. 220-224, 1991.

[9] Mulyono, S., *"Wayang; Asal Usul, Filsafat, dan Masa Depannya"*. Penerbit Alda, pp.84,1975.

[10] Mulyono, S., *"Wayang; Asal Usul, Filsafat, dan Masa Depannya"*. Penerbit Alda, pp.89,1975.

[11] Purwadi, M, *Seni Pedhalangan Wayang Purwa*, Penerbit Pandji Pustaka, pp.69-87, 2007.

[12] Salim, *Wayang Ukur Karya Sukasman Studi Ekplorasi Bentuk,* Eksplanasi Journal, Vol. 6, No. 1, pp.78-93, 2011.

[13] Salim, *Warna Sunggingan dan Komposisi Wayang Beber Pacitan.* Canthing Journal, Vol.1, No.1, pp. 1-9, 2012.

[14] Tabrani, P., *Bahasa Rupa,* Kelir, pp. 16-27, 1991.

[15] Sukir*, Bab Natah Sarta Nyungging Ringgit Wacucal*, Departemen Pendidikan dan Kebudayaan, p64-65, 1980.

[16] Tabrani, P., *Bahasa Rupa,* Kelir, pp. 196, 1991.

[17] Sayid, R.M., Bauwarna Wayang, Percetakan Republik Indonesia, pp.73-77, 1958.

[18] Long, R., *The Movement System in Javanese Wayang Kulit in Relation to Puppet Character Type: A Study of Ngayogyakarta Shadow Theatre*. Dissertation, pp.113-119, 1979.

The study concerning the Concreteness and Abstractness of Icon Design

Focused on the Mobile Application Icon

Park, Suna
Ewha Womans University
parksa42@gmail.com

Lee, Yoojin
Ewha Womans University
ideeper@gmail.com

Park, Seungho *
Ewha Womans University
pluxus@ewha.ac.kr

Abstract

Icon, an element of GUI, became essential means of effective visual communication and its importance is gradually increasing with the wide spread and advancement of smart phone. Trend of such icon is changing from Skeuomorphism presenting concreteness to minimalism presenting abstractness and simplicity. However, its performance as effective visual communication has not been verified yet and there is a lack of study on this subject. Therefore, the purpose of this study lies in verifying the concreteness and abstractness of icon design. The research on visual component of icon was conducted through literature review, analysis on Skeuomorphism and minimalism was conducted to recognize current design trend, and consideration on concreteness and abstractness of icon was carried out. Afterwards, icon design was classified into each form of expressions that are 'realistic-concrete-iconic-abstract' expression and then user survey was conducted. The significance of this study lies in the fact that literatures review on the design of icon, a current hot issue, and verification on its influence with division of 5 aspects including information recognition, preference, curiosity, purchase intention, and memorability for each form of expression have been conducted.

Keywords: GUI, Skeuomorphism, Minimalism, Icon

1. Introduction

1-1. Background & Purpose of Research

There has been a sudden rise in digital media with the advancement in IT. As a result, there was a necessity for new means of communication in media and icon was utilized as one of those means. With the generalization in product function, user experience became more important than technology and users started to take interest in GUI (graphic user interface) as a result of conducting effective interaction through graphic. Under such circumstances, Apple took innovative approach in GUI design by presenting new minimalism design, a deviation from its previous design philosophy Skeuomorphism. It became a big issue in the field of design and trend in application of app store has changed into minimalism design afterwards. Particularly clear change is presented in icon design. However, there is a criticism that such change in GUI design is just a temporary trend. It is a common knowledge that Skeuomorphic icon presents concreteness and minimalistic icon presents abstractness. However, effect of concreteness and abstractness in icon design on user has not been verified yet and there is a lack of study on this subject.

Application is a core contents indispensable in smart phone and its importance increased with the growth of smart device market. Various applications are introduced and icon, in flood of applications, plays an important role in decision making of consumer by inducing the attention of consumer. In other words, icon plays a role of catalyst to assist the recognition of applications in decision making process of consumer as it is primary element of contact. Design can enhance competitiveness among applications with same function. The scope of this study was restricted to mobile application icon and its influence on user was verified by dividing it into concreteness and abstractness reflecting the trend of Skeuomorphism and minimalism which are hot issues.

First, is there a difference in preference based on concreteness and abstractness of icon design?

Second, is there a difference in information recognition based on concreteness and abstractness of icon design?

Third, does the abstractness of icon design induce the curiosity?

Fourth, is there a difference in memory based on concreteness and abstractness of icon design?

Fifth, do concreteness and abstractness of icon design have effect on purchase?

The subject of inquiry is based on hierarchy of advertisement effect. Hierarchy of effect describes the effect of accumulative short-term effect from exposure to advertisement and purchase by consumer in stages[1]. Icon is an image that represents the application and its purchase process is similar with that of hierarchy of effect. A stage where positive image toward

---

[1] 이명천, 김요한(2012). 광고핵심이론. 커뮤니케이션북스

application turns into preference is very important as it leads to confidence in purchase.

1-1. Background & Purpose of Research

First of all, analysis on Skeuomorphism and minimalism was conducted by recognizing the current design trend through literature review. Also, theoretical consideration on visual components of icon and research on concreteness and abstractness of icon were conducted. The shape of icon design was classified into 4 stages for each form of expression and foundation for analysis on effective visual communication of icon as established based on it. Classification for forms of expression in stages refers to 4 stages of 'realistic-concrete-iconic-abstract' expression. The survey was conducted based on theoretical consideration. By selecting experiment group, user survey was conducted after manufacturing smart phone as a prototype. Evaluation on each question was conducted after presenting the prototype. After examining the recognition on icon design of application and preference for each form of expression, the factor of influence was looked into. Also, in order to conduct verification on subject of inquiry, independent evaluation was carried out for icon presenting each form of expression. Response on each item was made based on Likert 5 point scale. Upon completion of the evaluation, interview was conducted to ask opinions regarding each form of expression.

2. Consideration on GUI

2-1. Definition of GUI

GUI is abbreviation for graphic user interface and it enables more prompt and smooth interaction between people and computer using graphic[2]. It signifies user-centered design which provides convenience to user, an advancement from previous text-based user interface[3]. It enables easy learning and familiar approach with focus on visual aspect of work. User interface before introduction of GUI took form of CUI (character user interface) in which text command is delivered through keyboard to perform work and the result of work is indicated in text.. Afterwards, computer market presented rapid growth due to easier computer language computer followed by wide spread of GUI, computer market presented rapid growth with easy computer language and it adnvanced to be a strong media as it became a must for public from the domain of experts.

2-2. Change in Trend: Skeuomorphism & Minimalism

The design philosophy of iOS was 'Skeuomorphism' with focus on user experience before the introduction iOS7 of

---

[2] 곽호완,박창호,이태연,김문수,진영선, 실험심리학용어사전, 시그마프레스, 2008.

[3] 추영지, 사용성 향상을 위한 그래픽 유저 인터페이스(GUI) 디자인에 관한 연구 : 종합병원 키오스크의 시각적 구성요소를 중심으로, 홍익대학교 대학원 석사논문, 2007.

Apple in Jun. 2013. Skeuomorphism was often called as Skeuomorph. According to Gesseler (2012), it is compound word of 'Skeuous' which means 'tool' and 'Morphe' which means 'shape' in Greek referring to design that reflects the shape of tool as is. In other words, Skeuomorphism is to apply original shape and texture of real object to design as is and it is to express metaphor on screen. Hence, Skeuomorphism also referred to as 'real metaphor design' and it is realistic and concrete in expressing the image. Particularly, Apple has been leading the field of design referred to as sensible design and intuitive design because of Skeuomorphism. The competitiveness of Apple lied in providing GUI differentiated from other OS. Skeuomorphism was the core of Apple's design and its design philosophy. It stimulated analog sensibility by converting shape of analog into digital as is and thus reduced the difference between analog and digital. Function could be understood relatively easy and intuitive without manual and design full of details were enough to visually attract the interest of user. Due to such Skeuomorphism, previous iOS was evaluated to have maximized the user experience and received great reviews from users as well.

Figure 1 Skuomorphism icons of iOS6

On the other hand, there also exists criticism on Skeuomorphism. To be specific, it is a criticism about excessively realistic description for the object of metaphor. It suggests that focus on realistic visual expression produces unnecessary information and thus complicates it. Although increase in amount of information assists its understanding in aspect of visual perception and recognition, excessive amount of information may cause confusion in perception and recognition system of people[4]. Also, it would lower the understanding on function of application for users without experience of using digitally expressed objects in actual life. In addition, there is a limitation in producing creative outcome as it expressed the shape of actual object as is.

However, GUI design entered upon a new phase with the introduction of iOS7. Deviating from realistic and three-dimensional expression in the past, it has converted into minimalism. Minimalism refers to design which minimizes the expression disregarding unnecessary description. iOS7 is referred to as flat UI as it presents flat and neat image and it conforms to the essence of minimalism which promotes minimization and moderation in design element. Looking into new icon, it takes simple features of 2D presenting either iconic or abstract shape. Minimalism is in pursuit of extreme simplicity and implication of its significance.

---

[4] 김성훈, 권동은, 스마트폰 시각커뮤니케이션 디자인을 위한 아이콘 조형 요소 연구, 한국디지털디자인학회 31, 291-300, 2011.

Figure 2 Minimalism icons of iOS7

Minimalism started to receive attention in aspect of methodology to enhance the focus on contents by concentration on design of elements with objective[5]. In the past when concept of smart phone was unfamiliar, it was necessary to reflect the concept of reality as is to inform its usage. However, with wide spread of smart phone, there is no need for figurative description of function as recognition of function has become a common knowledge. Although it may seem monotonous and dull, it became much easier to control and thus one can focus on original contents. Also, it is chic in aspect of aesthetics. On the other hand, some suggest that such dullness lower the understanding of user. When there almost no design element, it cannot fulfill its role of delivering the information sufficiently and cause confusion[6]. On the other hand, the biggest advantage of minimalism lies in its flexibility. With the introduction of device in various sizes including desktop, smart phone, pad, and others, design suitable for each display size was in demand and thus it is changing into responsive web[7]. More effective development in design was necessary with the introduction of such responsive web. As a result, minimalism was introduced as its countermeasure and settled as a design trend. Minimalism design is suitable for responsive web as it is more effective and convenient to expand with less resource compared to Skeuomorphism.

3. Icon

3-1. Visual Components of Icon

It is essential to consider visual design as icon is for effective information delivery. Particularly, it is essential for application icon of app store to have design which can draw attention of users. In this study, visual components of icon were defined as shape, color, and typography.

3-1-1. Shape

Shape refers to the appearance or form of object. Dictionary definition is "coherent form taken by part or whole structure" (National Institute of Korean Language) and Samara(2009) defined shape as the design element which includes all types of image and characters. Shape is important element that forms sensory experience as it is recognized by visual and tactile sensation. Shape is expressed in various forms. Samara(2009) largely divided the form of expression for shape

---

[5] VINYL X, UX 전문가들의 관점에서 바라본 플랫디자인의

장점2013.12.18http://vinylx.blog.me/20201455054

[6] 김성훈, 권동은, above

[7] Responsive web design (RWD) is a web design approach aimed at crafting sites to provide an optimal viewing experience—easy reading and navigation with a minimum of resizing, panning, and scrolling—across a wide range of devices

as 4 stages of 'realistic-concrete-iconic-abstract' to express spectrum from concrete representational description to abstract expression. Such spectrum is as illustrated in below Fig 3.

Figure 3 Spectrum about realistic-concrete-iconic-abstract

More realistic sensation is presented when the image is close to concreteness and more interpretation is required when it is closed to abstractness. The shape of icon has been changing corresponding to the change in era and it keeps developing. Although significance of difference in recognition corresponding to type of shape may change, there is no change in identity and visual effect of shape itself.

3-1-2. Color

Color presents the biggest effect after shape in aspect of efficiency among cognitive design elements (Geunyeong Yang, 2004). Dictionary definition of color is the trait of visual sensation which can be identified by spectrum wave of light and it has three attributes of color, brightness, and chroma[8]. Jinho Lee and Namsik Lee(2003) suggested that the use of color gives focus on important information, increase the understanding, and increase reliability and attractiveness. Also, it was revealed that color enables more realistic description of object and increases the memory of user compared to black & white. It is essential that color shall be used for easy distinction of icon. It is important to use as small number of colors as possible although there is difference in number of available colors for expression based on system specification. Even when there is limited number of colors available, richness of color can be sensed when taking advantage of difference in brightness and chroma. Color combination gives various color sensation that cannot be presented with just one color thus it assists effective message delivery.

3-1-3. Typography

With the expansion of media, typography come to have much more significance in modern design without dominance of letterpress printing or metal type and it refers to overall design activities relevant to characters that include design of font, readability, etc. In other words, it refers to all design using characters for aesthetic value[9]. Character also is one of visual element and it can induce various message delivery effect with vision.

Looking into the study by Seunggeun Yim(2009) and Yunhee Jung(2013), typography applied to icon is largely divided into two types that are 'application of itself as symbolic image' and 'text information that supplements the image'. CI and BI is the example of such symbolic image. Typography that

---

[8] 월간미술, 세계미술용어사전, 월간미술, 1999.

[9] 김일태, 윤기헌, 김병수, 설종훈, 양세혁, 만화애니메이션사전,

한국만화영상진흥원, 2008.

supplements the image enables easy understanding on significance of sentence. In regards to symbol in typographic shape, however, influence of visual aspects including size, height, width, and others of character on message and structure of icon shall be considered. Since size of icon is small, it becomes complicated and may cause confusion in delivering the message when too much typography used thus great skill is necessary for its use.

3-2. Concreteness & Abstractness of Icon

3-2-1. Concreteness

Concreteness refers to specific trait possessed by object or subject. Icon with concreteness describes the feature of object as is and its contour shall be described clearly. Concreteness is presented when describing actually existing object detectable by sensory organs of human being and significance of concreteness lies in existential reproduction of object[10]. Realistic expression based images are self-explanatory. Since icon with concrete shape directly expressed actual object, described subject can be recognized at a glance and easy understanding on function of application is available. However, high degree of concreteness does not lead to effective delivery of information all the time. In regards to same subject, a drawing that depicts the subject may be more effective than realistic photo. Since the increase in concreteness brings about visual complexity, it is very important to pursue balance with simplicity[11]. Excessive visual information gives user unnecessary information and thus lowers the understanding and clouds the judgment. Therefore, user may have difficulty sorting out necessary information. There is necessity for proper information delivery technique which grasps the trait of information to deliver.

3-2-2. Abstractness

Dictionary definition of abstractness is 'a trait that cannot be experienced in reality or concrete'. Abstract object is opposite of concrete object referring to non-concrete and ambiguous object[12]. In general, it is understood as a concept which describes the state deviating from concrete object. It stems from object shape of natural world not conceptualization of object in real world[13]. Shapes of circle, triangle, quadrangle, and others are also a type of abtraction. In art history, it is suggested that abstract art was introduced in the prehistoric age and dolmen shape in the neolithic age, geometric pattern of Egyptian pyramid, and anti-natural stylization are also a type of abstract[14]. When triangle and quadrangle that appear in

---

[10] 신석규, 시각기호의 구체성과 추상성에 관한 진화론적 형태변이 논의, 한국디자인문화학회, 15(4), 272-289, 2009.

[11] 이진호, 이남식, graphic user interface, 안그라픽스, 2003.

[12] 김양순, 날염디자인에 있어서 추상적 표현에 관한 연구 : 패턴 디자인을 중심으로, 이화여자대학교 산업미술대학원 석사학위논문, 1991.

[13] 신석규, 위의 글. Above

[14] 김해성, 현대 미술을 보는 눈, 열화당, 1988.

Egyptian pyramid is abstract in its absolute pure shape created from geometrical shape, shell-and-bone characters of China can be referred to as natural abstract considering the fact that it characterized the shape of object.

3-3. Trait of icon design presenting each form of expression

There is a variety of classification standards applied by each researcher and it is also interpreted differently. In this study, classification of icon design was conducted based on stages from concrete shape to abstract shape classified by Samara(2009). The image was primarily classified as 'realistic-concrete-iconic-abstract' for each form of expression and the transformation in each form of expression was classified the second.

Table 1 Examples about expression, Samara(2009)

Realistic	Semi Realistic	Concrete	Semi Concrete	Iconic	Semi Iconic	Abstract

3-3-1. Realistic Icon

Most realistic icon refers to an image of photo itself. Pure photo image is considered as outstanding form of illustration as it presents fast information delivery speed. Due to realism and directness of photo, viewer can understand the contents of image very quickly. Photo image can be considered as manufactured goods as it is always applied of techniques such as decision making on composition of photo, focus, trimming, etc[15]. When using photo image, it is most like to be accepted as 'truth' even though it is manufactured or forged. Realistic icon refers to icon of all images with realistic depiction using photo. Although retouching has conducted to photo image, it can be considered as realistic icon depending on the extent of expression.

Figure 4 Realistic icon

3-3-2 Concrete Icon

It refers to illustration which expresses actual object close to representational depiction. More detailed and concrete depiction presents more realistic sensation thus significance of object itself becomes important. More creative expression is available compared to photo image and means of information transmission and its application also become diverse. Samara(2009) mentioned that strength of illustration lies in delivering visual sensation of emotional, poetic, organic, and

---

[15] Samara,T., Design Elements : A Graphic Style Manual : Understanding the Rule and Knowing When to Break Them; 경노훈, 박경숙 역(2009). 디자인언어 그 시각적 원리를 언제 깨뜨릴까, 아트나우, 1999.

primary human nature compared to photo. Also, in regards to concrete icon, non-existing details in reality can be added and focus on movement, texture, arrangement, space, and light is available.

Figure 5 Concrete icon

3-3-3. Iconic Icon

Icon refers to a symbol that is related to the subject and simply presents the trait of certain subject[16]. Iconic expression enables easy recognition and memory of icon with maximum moderation and simple form of depiction. Lidwell, Holden, and Butler(2003) defines iconic icon as similar, illustrative, and symbolic icon. Similar icon is a type of icon that uses visually similar image. There are icons of falling rocks, speed bumps, and others as examples. It depicts same shape as actual object. In regards to illustrative icon, image, behavior, object, and others than can be associated with the subject is used rather than expression of subject as is. In case of airport or restaurant, it is more effective to use image of air plane or tablewares instead of directly expressing the shape of building itself. It is representative case of illustrative icon. Symbolic icon sometimes present abstract concept and it is icon useful in delivering the information related to easily recognizable subject. In regards to the brake of vehicle or lock function of smart phone, lock image which represents the control function is used although it looks different from actual brake. It can be considered as an example of using symbolic icon.

Table 2 Similar, Illustrative, Symbolic icon

Similar icon	Illustrative icon	Symbolic icon

In order to express subject as iconic icon, the most widely recognizable element shall be found. It is to create a new language with unique identity through diverse and distinctive expression rather than imitating lookalike subject.

Figure 6 Iconic icon

3-3-4. Abstract Icon

Abstract icon refers to icon which gives a form to concept that does not exist in reality or image of which its expression deviates from previous form. It corresponds to abovementioned concept of abstractness. The former can be referred to as arbitrary icon in which agreement is made in

---

[16] 김정희, 모바일기기 앱-아이콘 조형의 커뮤니케이션과 색채와의 상관관계 연구, 한양대학교 박사학위논문, 2012.

abstract form for delivery and acceptance of its meaning[17]. It symbolizes the significance of object by implication. As its source is basic figure for minimalistic expression, its design element takes simple and coherent form and it is often referred to as single color expression in minimalism.

Figure 7 Abstract Icon

4. User survey on application icon design presenting each form of expression

4-1. Subject & Method of Survey

User survey on icon design presenting each form of expression was conducted. User survey was conducted for a month from 2014.04.14 to 05.14 and users with experience of purchasing application from app store among a group of people in their 20's and 30's who use smart phone the most were selected as its subject. Total 44 subjects have participated in the survey. For experiment group, same condition as actual app store was created to present manufactured smart phone prototype and subjects were asked to answer each question.   7 types of icon classified into each form of expression within same category were presented in experiment group and it is icon in each stage associated with spectrum of [Table 1]. To disregard the influence of sequential change in concreteness and abstractness, icons were presented in random order. Education on icon presenting each form of expression was conducted before user survey and direct control of prototype was allowed for the subject. In regards to the item, the evaluation was conducted immediately after viewing the icon. Survey was conducted with division into three parts. First part is composed of 6 questions on preference for icon presenting each form of expression and pattern of significant sequential change and icons of three categories were presented. Second parts is composed of total 80 questions including 20 questions each for independent evaluation of icons presenting 4 forms of expression that are 'realistic icon', 'concrete icon', 'iconic icon', and 'abstract icon'. Each question is about information recognition, preference, curiosity, purchase intention, and memory and response was to be evaluated with Likert 5 point scale. Last, icon of 1 category was presented to extract in depth the element of information recognition, aesthetic satisfaction, effect on selection, and easy memory and each part was composed of 8 questions. Then, the survey was completed upon conducting a brief interview to ask opinion on icons presenting each form of expression.

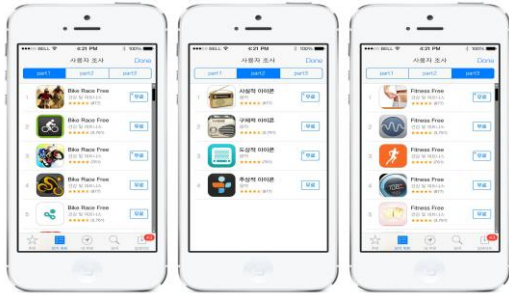[17] 박은애, 아이콘의 유형별 메시지 전달 효과에 관한 연구 -웹 브라우저 아이콘을 중심으로-, 홍익대학교 산업미술대학원 석사학위논문. 2010.

Figure 8 Prototype

4-2. Survey result on preference for icon presenting each form of expression

4-2-1. Experiment Group 1: Bike Icon

In regards to all parts of experiment group, icon that belongs to category with balanced distribution of icon presenting each form of expression was selected. As a result of preference survey on icon presenting first form of expression, bike, dictionary, and sketch icon were selected as the subject of experiment. 7 icons in each stage of expression form were randomly arranged to examine its preference. Multiple numbers of selection were available for preferred icon.

Table 3 Experimental case 1 : Motorcycle icon

1	2	3	4	5	6	7

Table 4 Result of experiment 1

Variable	Expression	Frequency	Percent(%)
5	Abstract	18	37.50%
7	Semi Realistic	12	25.00%
2	Iconic	6	12.50%
4	Semi Iconic	5	10.42%
6	Semi Concrete	4	8.33%
1	Realistic	2	4.17%
3	Concrete	1	2.08%

It was revealed that abstract icon (37.505) presented highest preference among bike icon experiment group followed by semi-realistic icon (25%). 1st and 2nd ranked icons occupied more than half. On the other hand, preference of icon with expression from presenting concreteness was the lowest.

4-2-2. Experiment Group 2: Dictionary Icon

Table 5 Experimental case 1 : Dictionary icon

1	2	3	4	5	6	7

Table 6 Result of experiment 2

Variable	Expression	Frequency	Percent(%)
4	Iconic	21	45.65%
2	Semi Concrete	15	32.61%
6	Concrete	3	6.52%
7	Abstract	3	6.52%
5	Realistic	2	4.35%
1	Semi Realistic	1	2.17%
3	Semi Iconic	1	2.17%

It was revealed that iconic icon (45.65%) presented the highest preference in dictionary icon experiment group followed by semi-concrete icon (32.61%). 1st and 2nd ranked icon in experiment group 2 also occupied more than half. Form of expression presenting the lowest preference was revealed to be semi-realistic (2.17%) and semi-iconic (2.17%).

4-2-3. Experiment Group 3: Sketch Icon

Table 7 Experiment 3 : Sketch icon

1	2	3	4	5	6	7

Table 8 Result of experiment 3

Variable	Expression	Frequency	Percent(%)
1	Abstract	15	28.30%
2	Iconic	11	20.75%
4	Concrete	11	20.75%
5	Semi Iconic	5	9.43%
3	Realistic	4	7.55%
6	Semi Realistic	4	7.55%
7	Semi Concrete	3	5.66%

It was revealed that abstract icon (28.30%) presented the highest preference in sketch icon experiment group followed by iconic and concrete icon. The preference of icon presenting concreteness was revealed to be low in experiment group 3 as well.

4-3. Result on pattern recognition of sequential change

Table 9 Frequency of pattern recognition of sequential change

	Experiment1	Experiment2	Experiment3
Respondents	34	32	33
Percent(%)	77.27%	72.73%	75.00%

Table 10 Total result

Experiment		Realistic-Concrete	Concrete-Iconic	Iconic-Abstract
1	Frequency	13	15	19
	Percent(%)	38.24%	44.12%	55.88%
2	Frequency	9	15	9
	Percent(%)	28.13%	46.88%	28.13%

3	Frequency	10	13	12
	Percent(%)	30.30%	39.39%	36.36%
Average(%)		32.22%	43.46%	40.12%

Experiment on pattern recognition of sequential change was conducted to examine whether or not the subject recognizes classification stage for each form of expression. This study is about concreteness and abstractness thus the degree of recognition on pattern change was verified. Average of 75% of subject responded that they recognized the pattern of sequential change in each experiment group. In order reexamine how accurately subject recognized the pattern, the percentage of correct answers was measured by classifying the section for each form of expression and frequency of subject who accurately recognized sequential pattern of each section was measured. As a result, it was revealed that the recognition rate on change in sequential pattern from concrete icon to iconic icon was the highest presenting the average of 43.46% and it was lowest for change in sequential pattern from realistic icon to concrete icon as subject had difficulty recognizing the boundary between representational depiction and photo.

4-4. Result of independent evaluation on each form of expression

Table 11 Icons for independent evaluation experiment

Realistic icon	Concrete icon	Iconic icon	Abstract icon

Second, as a survey to verify problem of icon presenting each form of expression, experiment group of radio icon was selected as its subject. In case of realistic icon, it has problem of difficulty in understanding the problem as there is no way to figure out its usage when image of very old analog product is used or in case of user without experience in use. In order to examine this aspect, old analog radio icon was selected as experiment group. Concrete icon has problem in that excessive or complicated depiction may lower the understanding. Therefore, icon which depicts more refined and representational image was selected. Iconic icon has problem in that function cannot be recognized with excessive simplicity and it is monotonous in most cases due to influence of iOS7. Therefore, in order to verify the influence exerted by the number of colors, icon of single color with most simple shape of radio was selected and opinion and users was received. In regards to abstract icon, understanding on icon may differ accordingly with previous knowledge on the icon when it is random icon. Therefore, abstract icon of less known brand was selected to conduct experiment.

4-4-1. Information Recognition

Table 12 Result about Information recognition

	Realistic	Concrete	Iconic	Abstract	Avg.
Function recognition	4.43	3.70	2.00	1.11	2.81
Icon distinguish	4.14	3.55	2.25	1.59	2.88
Quick recognition	4.20	3.52	1.98	1.27	2.74
Disorder interpretation	4.07	3.55	2.09	1.27	2.75
Form information	4.39	3.73	2.64	1.50	3.07
Expression	3.98	3.57	2.30	1.18	2.76

As a result of survey, realistic icon presented the highest average value for all 5 items related to information recognition followed by concrete icon. Iconic icon and abstract icon presented value lower than average in 5 items.

4-4-2. Preference

Table 13 Result about preference

	Realistic	Concrete	Iconic	Abstract	Avg.
Preference	2.57	2.89	2.80	2.50	2.69
Likability rise	2.30	2.28	2.70	2.32	2.40
Effect of Form	2.59	2.98	2.98	2.55	2.78
Effect of Color	2.98	2.93	3.07	2.52	2.88

In regards to preference for each form of expression, concrete (2.89) and iconic (2.80) icon presented 1st and 2nd highest average value displaying slight difference. Iconic icon (2.70) also presented the highest average value for increase in favorability due to form of expression and other forms of expression presented similar average value. In regards to preference and increase in favorability, it was suggested that realistic and iconic icon receive more influence by color rather than shape.

4-4-3. Curiosity

Table 14 Result about curiosity

	Realistic	Concrete	Iconic	Abstract	Avg.
Causing Curiosity	2.25	2.77	3.11	3.18	2.83
Needs for detailed info.	2.41	2.59	2.93	2.84	2.69
Effect of form	2.41	2.89	3.25	3.18	2.93
Effect of color	2.18	2.36	2.82	2.66	2.51

In curiosity item, abstract icon (3.18) presented the highest average value followed by iconoic icon (3.11). In regards to desire to examine detailed function, however, it presented the highest average in order of iconic icon (2.93) followed by abstract icon (2.84). As the element that induces the curiosity, shape exerted more influence compared to color in all forms of expression. Particularly, the difference between average value for influence by shape and color was the highest in abstract icon suggesting that it was more influenced by shape compared to other forms of expression.

4-4-4. Purchase Intention

Table 15 Result about purchase intention

	Realistic	Concrete	Iconic	Abstract	Avg.
Intention of	2.34	2.52	2.50	2.25	2.40

	Realistic	Concrete	Iconic	Abstract	Avg.
purchasing					
Effect of form	2.84	2.84	2.84	2.68	2.80
Effect of color	2.50	2.27	2.61	2.41	2.45

Form of expression with the highest average value of purchase intention was concrete icon (2.52). Realistic (2.34) and abstract (2.25) icon presented value lower than average. In regards to a factor that has influence on purchase, it was more influenced by shape in all forms of expression.

4-4-5. Easy Memory

Table 16 Result about easy memory

	Realistic	Concrete	Iconic	Abstract	Avg.
Ease of memory	3.66	3.18	1.11	2.43	2.6
Effect of form	3.43	3.20	1.50	2.70	2.71
Effect of color	2.52	2.52	1.59	2.59	2.31

In regards to easy memory of icon presenting each form of expression, realistic icon (3.66) presented the highest average value. Iconic icon (1.11) presented the value lower than total average. In regards to easy memory, realistic and concrete icon was more influenced by shape and abstract icon was more influenced by the color.

4-5. Result of in-depth survey on icon presenting each form of expression

Next, fitness icon was selected for experiment group and 7 icons in each stage of expression form were presented with random arrangement. Then, survey to extract in-depth element was conducted. Subject was allowed to select only one icon for each item and multiple numbers of selections were allowed for selection on factors.

Table 17 Experiment : Fitness icon

1	2	3	4	5	6	7

4-5-1. Information Recognition

Form of expression with the most ease in recognizing information of icon was revealed to be realistic (31.82%) and iconic (29.55%) icon. On the other hand, no one selected the abstract icons. Most of subject answered that realistic image (25.45%) and understanding on meaning (23.64%) are factors for easy recognition of information followed by detailed description (16.36%), simple shape (9.095), and simple expression (9.09%).

Table 18 Result about information recognition

Rank	Variable	Expression	Frequency	Percent(%)
1	1	Abstract	14	31.82%
2	2	Iconic	13	29.55%
4	7	Semi Realistic	11	25.00%
5	3	Concrete	4	9.09%
3	4	Semi Concrete	1	2.27%
6	5	Semi Iconic	1	2.27%
7	6	Abstract	0	0.00%

Table 19 Factors of information recognition

Rank	Factors	Frequency	Percent(%)
1	Realistic image	28	25.45%
2	Understanding Implicated meaning	26	23.64%
3	Sophisticated description	18	16.36%
4	Simple shape	10	9.09%
5	Abstract expression	10	9.09%
6	Simple color	9	8.18%
7	Harmony of colors	4	3.64%
8	3 dimensional expression	3	2.73%
9	Simple expression	1	0.91%
9	Etc	1	0.91%

4-5-2. Aesthetic Satisfaction

Table 20 Result of Aesthetic satisfaction

Rank	Variable	Expression	Frequency	Percent(%)
1	2	Iconic	12	27.27%
2	6	Abstract	11	25.00%
4	1	Realistic	9	20.45%
5	4	Semi Concrete	5	11.36%
3	5	Semi Iconic	4	9.09%
6	3	Concrete	2	4.55%
7	7	Semi Realistic	1	2.27%

Table 21 Factors of Aesthetic Satisfaction

Rank	Factors	Frequency	Percent(%)
1	Simple shape	26	23.01%
2	Simple expression	20	17.70%
3	Understanding Implicated meaning	19	16.81%
4	Simple color	17	15.04%
5	Harmony of colors	8	7.08%
6	Realistic image	7	6.19%
7	Abstract expression	6	5.31%
8	Sophisticated description	4	3.54%
9	3 dimensional expression	2	1.77%
9	Simple expression	2	1.77%
9	Various colors	2	1.77%

Form of expression with the highest aesthetic satisfaction was presented to be iconic (27.27%) and abstract (25.00%) icon. On the other hand, preference of semi-realistic (2.27%) and concrete (4.55%) icon was low. This displays same result as the abovementioned preference survey of first part. Simple

shape (23.01%), simple expression (17.70%), understanding on meaning (16.81%), and simple color (15.04%) were extracted as the factor of aesthetic satisfaction.

4-5-3. Influence on Selection (curiosity)

Table 22 Result of influence of selection

Rank	Variable	Expression	Frequency	Percent(%)
1	6	Abstract	25	56.82%
2	3	Concrete	6	13.64%
4	5	Semi Iconic	5	11.36%
5	2	Iconic	4	9.09%
3	1	Realistic	2	4.55%
6	4	Semi Concrete	1	2.27%
7	7	Semi Realistic	1	2.27%

Table 23 Factors of influence on selection

Rank	Factors	Frequency	Percent(%)
1	Abstract expression	24	26.09%
2	Simple expression	16	17.39%
3	Simple shape	14	15.22%
4	Understanding Implicated meaning	12	13.04%
5	Simple color	10	10.87%
6	Sophisticated description	6	6.52%
7	Realistic image	5	5.43%
8	Etc	2	2.17%
9	3 dimensional expression	1	1.09%

As a form of expression which have influence on selection by inducing curiosity, abstract icon (56.82%) presented overwhelming occupancy of over 50%. Abstractness (26.09%), simple expression (17.39%), and simple shape (15.22%) were revealed to be the factor that induces the curiosity followed by understanding on meaning (13.14%) and simple color (10.87%) presenting slight margin.

4-5-4. Easy Memory

Table 24 Result of easy memory

Rank	Variable	Expression	Frequency	Percent(%)
1	2	Iconic	16	36.36%
2	1	Realistic	10	22.73%
4	7	Semi Realistic	7	15.91%
5	6	Abstract	5	11.36%
3	4	Semi Concrete	3	6.82%
6	3	Concrete	2	4.55%
7	5	Semi Iconic	1	2.27%

Table 25 Factors of easy memory

Rank	Factors	Frequency	Percent(%)

1	Realistic image	21	19.63%
2	Understanding Implicated meaning	17	15.89%
3	Simple shape	16	14.95%
4	Simple color	15	14.02%
5	Simple expression	14	13.08%
6	Sophisticated description	13	12.15%
7	3 dimensional expression	4	3.74%
8	Abstract expression	2	1.87%
8	Harmony of colors	2	1.87%
8	etc	2	1.87%

Iconic icon (36.36%) was revealed to be the easiest form of expression to remember followed by realistic (22.73%) and semi-realistic (15.91%) icon. Realistic image (19.63%), understanding on meaning (15.89%), simple shape (14.95%), and simple color (15.89%) were presented to be factor that enables easy memory. It is estimated that the subject chose realistic image as the factor since iconic image is also a form based on reality.

4-6. Rank for General Preference of Experiment Group

Table 26 Total rank from all experiments

Rank	Expression	Avg.rank
1	Abstract	1.7
2	Iconic	2.0
3	Concrete	4.0
4	Semi Realistic	4.3
5	Semi Concrete	4.7
6	Semi Iconic	4.7
7	Realistic	5.3

Rank value acquired through preference survey of all experiment groups was summed up to extract average rank. Icon with the highest preference was revealed to be abstract icon followed by iconic icon. Form of expression for 1st and 2nd rank icon presented relatively high average compared to other forms of expression presenting huge difference. On the other hand, icon with the lowest preference was revealed to be realistic icon.

4-7. Result of Interview

In regards to realistic icon, it was evaluated to be convenient in information delivery as it enables quick understanding on function of application. However, it was evaluated to lack aesthetics. It was suggested that expectation toward application is lowered due to dull design. There were multiple responses that it would be suitable for application with professional function with sole purpose of information delivery without pursuit of fun.

In regards to concrete icon, the response that it enables easy understanding on function of application also occupied more than half and it was evaluated to be more aesthetic compared to realistic icon. Although detailed description increased the expectation toward function of application, it was suggested

that excessive description and shape brings about confusion in identifying the icon hence makes it unfavorable. In addition, 9.09% of subject responded that trend had influence on the preference.

In regards to iconic icon, it was considered as most appropriate form of expression to express icon which enable easy recognition. However, it was suggested that unclear expression of shape may lower the understanding. It was revealed to be most aesthetic and receive influence of color the most. Its preference differed accordingly with the color and it seemed to indicate the trait of application as well.

In regards to abstract icon, many suggested that it is difficult to understand as it presents high degree of implication. The necessity for hint to recognize information was pointed out since there is no factor to recognize information of application. However, it was evaluated to be aesthetically pleasing and induce curiosity.

4-8. Analysis on Result

Consideration on subject of inquiry was conducted by integrating the result of user survey and the result is as illustrated below.

First, there was difference in preference based on concreteness and abstractness of icon design. Iconic and abstract icon presented the highest preference among icons presenting each form of expression and it was revealed that icon presenting abstractness is more preferred in comparison with icon presenting concreteness. Factor of aesthetic satisfaction was revealed to be simple shape and simple expression. However, not all icons with simple shape were preferred but just those which deliver the information presented by the icon. Preference of abstract icon was lower in case of unclear information delivery. Even though it takes abstract shape, it shall be recognizable to certain degree. Therefore, metaphor selection of shape is considered to be important. Metaphor shall have close relation with function of application or information for delivery. In other words, external features of object shall be utilized as a metaphor and it shall be general object that anyone can understand with ease. Average number of colors for icon with high preference was presented to 2.9. It is determined that small number of colors enables clearer and more concise understanding and such understanding leads to preference. It is recommended to use less than 3 colors. Concrete icon presented lower preference compared to abstract icon. Representational image was more preferred compared to photo image and excessively precise depiction of shape was less preferred compared to depiction in level of semi-concrete icon. Reason for low preference of concrete icon lied in the fact that it could not be distinguished from photo due to detailed depiction. It was determined that trend has small influence on preference as only 9.09% of subject responded that the trend had influence on the preference.

Second, there was difference in information recognition based on concreteness and abstractness of icon design. Form of expression with the easiest and fastest recognition of function was presented to be realistic icon and concrete icon also present high rate of information recognition. Recognition of function was easy regardless of fact that it is analog or old

object and excessive details and expression did not hinder the information recognition. However, it was revealed that there is huge difference in information recognition of iconic icon based on its shape. Although it presented the highest rate of information recognition, it also hindered easy recognition of information regardless of the fact that exterior of shape was expressed with simplicity. As it was aforementioned in survey result, information recognition of iconic icon is closely related to preference thus selection of metaphor is important. It is important to find metaphor with proper shape that clearly and concisely expresses the trait of object or information to deliver rather than just simplify the shape as is. Also, iconic icon was revealed to receive great influence by color due to simplicity of its shape. Association by color occurs based on symbolized perception and it has considerable amount of influence on recognition of application. On the other hand, abstract icon presented the lowest rate of information recognition and considered to be unsuitable for information delivery. Delivery of meaning is most important for easy and fast information recognition and original shape of object shall be maintained for delivery of clear meaning. In other words, external feature of object shall be utilized as metaphor as abovementioned in preference and it shall take very realistic shape or present simple expression of function trait.

Third, abstractness of icon design was determined to induce curiosity. Also, simple shape and expression were also determined to induce curiosity other than abstract expression. It was more influenced by shape compared to color.

Fourth, there was difference in memory based on concreteness and abstractness of icon design. Icon with detailed or realistic depiction enabled easy memory. Also, clear recognition on application information enabled easy memory. In case of iconic icon presenting simple shape, the result presented clear difference based on information recognition. Therefore, it is determined that representational depiction similar with actual object is necessary for easy memory.

Fifth, the concreteness and abstractness of icon design did not have influence on purchase. Purchase of icon was conducted with clear recognition on function of application regardless of concreteness and abstractness of icon design. In case of abstract and iconic icon with high preference, purchase intention was the lowest for icons with difficulty to recognize the meaning of its shape. It was determined that concreteness and abstractness do not have direct influence on purchase although it may induce people to examine detailed information.

5. Conclusion

More attention is being paid to GUI with the wide spread of smart phone and its function. Also, term called interface became common. As a component of GUI, icon is a means to assist effective visual communication in digital media and express the identity of application thus it has become more important. Under such circumstances, there has been a change in feature of GUI. Design innovation was conducted with change from Skeuomorphism with concrete shape to minimalism with abstract shape. However, verification on which is more effective visual communication between

Skeuomorphism and minimalism has not been conducted yet and there also is a lack of study on it. Therefore, the purpose of this study lied in verifying the influence of concreteness and abstractness of icon on user by dividing the degree of icon's concreteness and abstractness and classifying it into 'realistic-concrete-iconic-abstract' for each form of expression and conducting the user survey on 5 criteria of information recognition, preference, curiosity, purchase intention, and easy memory based on hierarchy model of advertisement as empirical study.

As a result of analysis, the preference of iconic icon was presented to be the highest and the preference was high for icon which clearly delivers its meaning. It illustrates the important of metaphor selection and external shape of object as is shall be utilized as metaphor. There was almost no influence by trend. Simple shape and expression were extracted as the factor of aesthetic satisfaction. It was determined that concrete shape enables the fastest recognition of function and maintenance of original shape of object enables easy information recognition. Also, it was verified that abstractness induces the curiosity. It suggested that concrete shape of icon bring about easy memory. Last, the concreteness and abstractness of shape did not have effect on purchase.

The significance of this study lies in the fact that literature review on icon design, a current issue, was conducted and influence of concreteness and abstractness on user was verified with 5 items. However, there lies limitation in generalization of result as subject of restricted to people in their 20's and 30's and evaluation on image was conducted with application of certain category only. Also, user survey was conducted disregarding the function of icon or other external factors. It is regrettable that specific visual factor could not be extracted based on survey result as the study was conducted to the extent of comparing and examining the concreteness and abstractness. Follow-up study shall be conducted to extract clear visual factors. Continuous research is necessary as classification standard may become ambiguous or new type of icon may be introduced in the future. Follow-up study that supplements abovementioned limitations shall be conducted and I expect that this study will be utilized as basic data at initial stage of research on icon design.

References

Books
· 곽호완,박창호,이태연,김문수,진영선,
  실험심리학용어사전, 시그마프레스, 2008.
· 이진호, 이남식, graphic user interface, 안그라픽스,
  2003.
· 이명천, 김요한(2012). 광고핵심이론.
  커뮤니케이션북스.
· Lidwell, W., Holden, K., Butler, J., Universal
  Principles of Design : A Cross-Disciplinary
  Refernece. Rockport Publishers, 2003.
· Samara,T., Design Elements : A Graphic Style
  Manual : Understanding the Rule and Knowing
  When to Break Them; 경노훈, 박겸숙 역(2009).
  디자인언어 그 시각적 원리를 언제 깨뜨릴까,
  아트나우, 1999.

Paper
· 김성훈, 권동은, 스마트폰 시각커뮤니케이션
  디자인을 위한 아이콘 조형 요소 연구,
  한국디지털디자인학회 31, 291-300, 2011.
· 김양순, 날염디자인에 있어서 추상적 표현에 관한
  연구 : 패턴 디자인을 중심으로, 이화여자대학교
  산업미술대학원 석사학위논문, 1991.
· 김정희, 모바일기기 앱-아이콘 조형의
  커뮤니케이션과 색채와의 상관관계 연구, 한양대학교
  박사학위논문, 2012.
· 김해성, 현대 미술을 보는 눈, 열화당, 1988.
· 박은애, 아이콘의 유형별 메시지 전달 효과에 관한
  연구 -웹 브라우저 아이콘을 중심으로-, 홍익대학교
  산업미술대학원 석사학위논문. 2010.
· 양근영, 모바일 컨텐츠의 효과적인 활용을 위한 GUI
  디자인에 관한 연구, 한양대학교 디자인대학원
  석사학위 논문, 2004.
· 추영지, 사용성 향상을 위한 그래픽 유저
  인터페이스(GUI) 디자인에 관한 연구 : 종합병원
  키오스크의 시각적 구성요소를 중심으로, 홍익대학교
  대학원 석사논문, 2007.

Web site
· VINYL X, UX 전문가들의 관점에서 바라본
  플랫디자인의 장점,
  2013.12.18http://vinylx.blog.me/20201455054All

Building an ecological sense of place in metropolitan public footpaths through architectural enclosure

Jiwon Lee
Hongik University
easyone@islandinbloom.com

Hyunsuk Kim
Hongik University
kylekim@gmail.com(Corresponding author)

Jinhyung Yoo
Hongik University
eeex@korea.com(Corresponding author)

Abstract
Taking the jam-packed buildings of the metropolitan space as a forest, we experience the in-between spaces or in other words public footpaths, and depending on the images produced from such experiences we come and go between the copiousness and penuriousness of life. But regrettably if we examine the properties of modern metropolitan space, indigenous placeness of the site are being divested in the course of commercial developments, and the sense of place that should be enjoyed are getting lost. This research aims to find the methodology of reverting back to the genuine sense of place through an ecocentric perspective of architectural enclosure.
For this regression to placeness, spatial organization in an enclosing shape that induces a movement known as 'stroll' was necessary. The logic that humans holistically desire an organic order of nature that essentially resembles themselves was placed as the clue to ecological sense of place, and this generated the connection between the expressive characteristics of the organically surrounding enclosure shapes of spacial organization and sense of place.

Keywords: sense of place, ecocentric thought, enclosure

1. Introduction
1.1 Research background and objective
In urban city space, generally a space that is enjoyable by the subject within that space is given. But within the density of each given space, can we indeed appreciate fully the 'sensation of refreshment' that is enjoyable within nature's 'forest'?
This research takes off from this question.
Taking the jam-packed buildings of the metropolitan space as a forest, we experience the in-between spaces or in other words public footpaths, and depending on the images produced from such experiences we come and go between the copiousness and penuriousness of life. But regrettably if we examine the properties of modern metropolitan space, indigenous placeness of the site are being divested in the course of commercial developments, and the sense of place that should be enjoyed are getting lost.
This study attempts to show a indigenous sense of place being formed in a space of a metropolis, specifically a public foot path; to show the elements that can prevent the formation of such a sense of place; and to show how we can recover a primordial sense of place through some tectonic order by an order of space called 'enclosure,' starting from the phenomenological concept of placeness and the sense of place of Edward Relph.
The significance of 'enclosure' comes from the repeatability of space that aims for introversion through the appropriate placement of phenomenological mass that acts as a wall (a characteristic of interior space). This scenario of repetitive space possessed by enclosures is used to bring out the pre-condition of the possibility that indigenous sense of place can be triggered in people or strollers experiencing specific places, and to generate

the resulting values.
Moreover, through the phenomenon of humans realizing the immediacies of life when experiencing a space, we expect this to be an important clue for rediscovering the values of sense of place in an ecocentric perspective.

2. General overview of architectural enclosures and ecological sense of place
2.1 Concept and features of the sense of place of metropolitan public footpaths
Kevin Lynch categorizes and describes the images of the city environment as 5 categories: paths, edges, districts, nodes, and landmarks, and among them he explains that paths consist of path stems moveable by observers, as well as elements that arrange or constitute relationships with other environmental components. (Hwang Yong-Seup,2010)
In this research, we aim to propose the significance of ecological sense of place presented at the eye-level of strollers based on the mobility of metropolitan footpaths that set off from the concept of paths. The city image of Kevin Lynch, in particular the public image and the interactive intimacy of humans experiencing it, is in contact with the restoration of placeness in the strollable in-between spaces of the city, or footpaths. About the metropolitan space, which overflows with sensate images, Georg Simmel warns that the subtle sensitivity of the city inhabitants are shrinking due to the distinctive and individual stimulations given by the fancy and artificial objects in the metropolitan city.
As a result of the shrinking and senseless attitude of humans, the contents of experiencing a place such as a city cannot help but become more and more objective and depersonalized.

Therefore, the public stroll space in which each individual stroller experiences must follow the ecocentric framework of thinking that resembles the substantive principle of nature, and facilitate the framework of cognition that restores indigenous sense of place.

Analyzing the lexical meaning of Jang-So(장소), Jang(장) means 'a place that comes into view due to energy', a state of naturally assigned environmental property. So(소) in the word Jang-So(장소) means 'a sectioned unit for abiding', a state of enculturation due to human involvement. (Lee Suk Hwan, Kim Young-Hwan, Theory of Place for overcoming the modernity of cities, 1996)

All organic and natural substances interact with the environment that it encounters in order to maintain their life cycle. Through this phenomenon, humans acquire appropriate senses of the place that each environment encounters, and on their own as one part of the place, in other words as a subject that experiences the place, will take on existential attitudes. With this, the place is perceived by the subject and becomes equipped with the form of an existential space.

Furthermore, the concept of place was founded by Edward Relph's phenomenological logic. He explained that 'true attitude towards a place can be understood as directly and purely experiencing the overall complexity of a place identity', and includes unconscious experiences in place identity and sense of place. The deeper the unconscious experience, the understanding of genuine placeness gets completed. Modern sense of place is surrounded by extravagant secular, uniform images, so the loss of place or placelessness in which genuine sense of place cannot be felt is being proceeded.

Edward Relph pointed out the directivity of not only consciousness but also the unconsciousness, and warned that sense of place could be authentic and pure, but if not so then it could degenerate into an a poor image that creates artificial or unnatural images that only stimulate human's peripheral nerves.

This means that the becoming of personal pure images through spontaneous imagination is not possible in a place called public footpaths experienced by strollers. With this, each individual place that transformed into a standardized landscape loses its indigenous placeness.

Accordingly, this paper tries to connect the ecological order of the enclosed space in order to recover the sense of place in an architectural type.
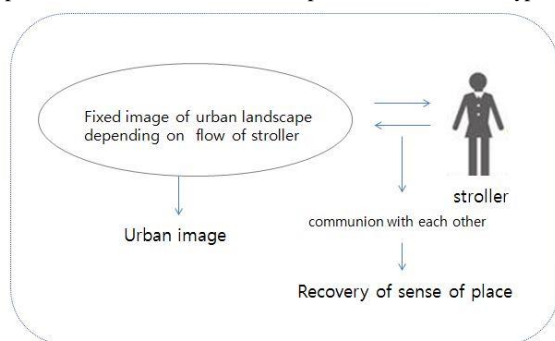

Figure1 relationship between foot path and a sense of place

2.2 Concept of architectural enclosure

In terms of the transforming role as the concept of place-making in general architectural spaces, the parts that make boundaries through a sense of mass, such as walls, are important. From human actions that are aroused within the places that are formed through boundaries, the values of the

place can be revealed. Edmund R. Leach said, "we are being created here and there through artificial boundaries at the heart of the continuum place at its natural state and without any cut offs" and mentioned the role of various relationships that are formed from boundaries. (Jin Mi-Hee,2008)

Enclosure has an effect of raising the territorial consciousness of humans in that region, and enhancing the psychological feeling of defense, relief and privacy. But if enclosure is too strong, this gives pressure and anxiety, and if the element of enclosure is taken away, it gives emptiness. (Kim Chul-Soo, Site Planning, 2007)

The key point of enclosure structure is to constitute the existential space of life by surrounding it with some others. This simply does not signify the limitation of space, but connects to the relationship between interior and exterior space. Therefore mental stability related to the intimacy felt by humans within an enclosed space is the characteristic of enclosure.

As such, based on a feature in which the space type experienced and the human having the experience communicate with each other in a stable condition, a directivity is derived, in which the space of the foot path can also recover the sense of place through the enclosed type.

2.3 Concept of ecocentric thoughts

The definition of ecology by German biologist Ernst Haeckel is 'the study of the interrelationship of organisms with their environment and each other, and in a broader meaning, the study that includes not only the physical survival conditions but also the mental elements in the environment.'(Lee Ji-Yeon, 2002)

Thus, we can say that the key to ecological thinking is complying with nature's organic principles and generating a countermeasure that permanently circulates the responding relation. The awareness of this living organic aspect of nature, and human's interrelationship tendency also influences the architectural shape.

According to Rhee Yoon-hee (2006), the feature of ecocentric thinking in modern architectural expressions are divided into wholeness, circularity, and homeostasis. This signifies that ecofriendly architectural shapes continually focus on finding nature's fundamental immanence. Such ecological feature projects the already existent and manifesting phenomenal intrinsic value of the actual space

Figure2 Characteristics of ecocentric thought

3. Territorial relation analysis of enclosure and sense of place

The world of architecture by Luis Barragan, who carried out architectural actions through enclosure, has the feature of triggering indigenous sense of place within the role of walls and the formation of relationships with its surrounding elements.

As claimed by Relph, the meaning of the recovery of the sense of place - that is, examples of inspiring a person's internal view and unconscious sense of place - is as follows. It is done through a concept of the natural order being contained in the enclosed architectural type of Luis Barragán, the organic relationship with nature that is the goal of the architecture of Soswaewon, and an analysis for an ecocentric thought between nature and humans, which is completed by Thoreau in 'Walden'.

This serves as an analysis framework for the possibility of space in which you can intimately communicate with the place.

3.1 Relationship between landscape and architectural structures through enclosed role of wall

The form of walls in Luis Barragan's architecture does not simply act as a boundary that divides a space, but signifies an architectural device that builds enclosure as an element that acts as a wall. This is inserted into the space as a tool that induces conscious, unconscious sense of place of the human experiencing that space.

Figure3 Classification of the role of walls

Features of Luis Barragan's enclosure-like architectural actions are as follows.

First, from the continuous repetition of intimate spaces, he encourages the effect of an individual's secretive internal vistas, contemplations and imaginations. The role of walls then no longer acts as a functional shelter of architecture, but is considered as a device that fulfills more than that. Moreover, rather than just a simple architectural boundary, this allows a partnered presentation of architecture and nature through the natural human scale of the public.

Second, by assigning human and nature as a medium to the shape of walls, a landscaping element of the nature, he attempts to make harmony of the combination of natural elements such as sky, water, wood, ray, shadow that are related to lighting, ventilation, rather than just the mere view.

Therefore, he aims for emotional architecture through essential values that are given to humans by architectural spaces developed by humans.

Figure4 Architectural structure of Luis Barragan

3.2 Organic relationship between ecological landscape and architectural structures

Figure5 View of Soswaewon Garden

The space configuration of the nature friendly Soswaewon Garden comes in contact with the ecological sense of place that conforms to nature's organic principles. The architectural structure of Soswaewon Garden takes on a shape that abides to its surrounding natural environment. This shows the property of integrating with the organic nature, and together presents the formative connections. Thus, this supports the holism of the internal structure called Soswaewon within the overall structure called nature. The space of the exterior nature and the interior

Soswaewon is open, sharing the process of receiving feedback from one another, thereby possessing an ecological function.

From this condition of dynamically giving and receiving, homeostasis is maintained by the organically sustainable circulation system.
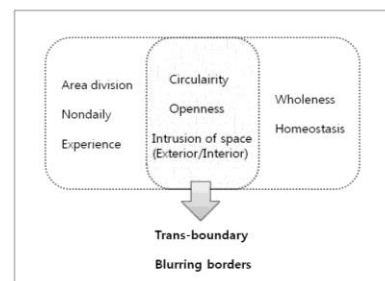

Figure6 Placeness that conforms with ecocentric thought

3.3 Sympathetic relationship between humans and nature, through an ecocentric thought

Figure7 Thoreau's Hut at Walden

Henry David Thoreau suggests how humans can communicate with nature in modern times through a practical image of nature, which forests have. He warns that humans can't realize the value of space, which humans have had from time immemorial, if we own nature with an ambivalent attitude that originates only from human desire.

Generally, we have enough space. Our horizon isn't immediately in front of us. Thick trees or lakes aren't right in front of our doors. However, some spaces are always developed and approaching toward us intimately. These spaces are owned and enclosed by humans in some ways, with their natural elements tamed.

When people respect nature, forests, and seasons, and build a friendship with them, encountering those spaces leads to an unseparated familiarity. This familiarity leads to each individual's inner comfort. This feature is similar to the essence of the enclosed space type.

Thoreau shows a relationship between practical nature and humans, who must communicate with the nature in a haptic way. Thoreau plainly systemizes an essential value humans must finally enjoy through a directly experienced, perceived and acknowledged procedure.
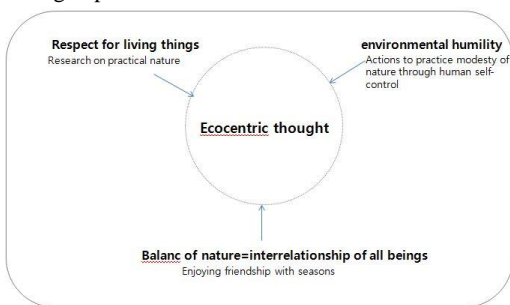

Figure8 Sympathetic relationship through an ecocentric thought

3.4 Space-organizational association between architectural enclosure and ecological order

Through analyzing a feature of the architectural enclosure of Luis Barragán, a condition triggering an ecological environment relationship in Soswaewon, and the ecocentric thought of Thoreau through Walden lake, we found that the function of a wall bounding an inner space and an outer space - that is, a mass such as a wall for forming the enclosure - had a process of becoming borderless, which blurs its boundary.

. Through such open and unclosed space features, architectural forms that bring about enclosures have a characteristic of stirring up and circulating the natural interpenetrate phenomenon of nature.

Figure9 Ecological sense of place through architectural enclosure

4. Building factors of the sense of place in Metropolitan public footpaths

The building of the sense of place in public footpaths is done within the scope of ecological thinking. This is the clue that the scope of a stroller's awareness of a place goes through some kind of relationship formation. The standards regarding how much sense of place can be restored from the image of metropolitan public footpaths, in which strong aesthetic experiences of humans in substantive natural environments are developed artificially, and the variance in its accompanying elements, are as follows.

As a result of analyzing the case study of Luis Barragan's architectural enclosure features and Soswaewon's sense of place through ecological placeness, in common the circulatory continuity between the interior and exterior was generated from the place practicing architecture. This meant that the inner intimacy within a person's house living in the metropolitan city must be manifested in the space between outside buildings, between nature, and thus, in-between space through at least the minimal framework.

The formation of a sense of place for public foot paths being experienced through eyes of strollers engaged in the activity of walking within the foot paths, as an external space of a residential or non-residential architecture type, must focus on deriving a continuous order with an ecological enclosure through an open but minimum sense of mass of natural type.

. Despite the fact that this order is something that is being newly assigned to architectural actions, it signified that this must aim towards the direction of a concentrated holistic environment development from the organic equality with nature.

5. Conclusion and proposal

This research started from the question whether strollers that must experience placeness within the locational density of metropolitan public footpaths can enjoy the sensation of refreshment in the substantive nature's 'forest'. To establish architectural enclosures that aim for the building of ecocentric

placeness and the set-up of boundaries in footpaths, we had to focus on the relationship between nature and the buildings located in surrounding areas of the footpaths.

Since the formation of foot paths in public regions of a metropolis in this study was set as a concept suitable for human walking, they could refer to in-between spaces of already completed architectural structures, or in-between spaces of landscapes.

The characteristics of such public footpaths were derived as follows.

First, public footpaths as a concept of the in-between space amid buildings required the buildup of enclosure through the blurring of interior and exterior architectural boundaries, in other words, through a sense of mass such as a conceptual wall that focuses on going borderless. In this case, the introvert constitution of exterior space through a connection with the already formulated privacy oriented enclosure in the architectural interior was necessary.

A focus of the enclosed type is to recover the 'placeness' of a certain place through the role of walls for forming foot paths and new ties with strollers to make them feel a sense of place therein. Since such an organic interrelation was just an ecological feature of nature, it led in a direction of harmonizing with nature, resulting in each boundary between territories getting blurred.

Walls became not physical walls but a subject that formed a place within which memories and associated time were contained, and preparations and experiences occurred.

. In this manner, act of creating a volume of a place was being constiuted by each stroller in relative and multi-directional ways.

Secondly, foot paths among landscapes meant organizations through minimal architectural frames.

The sense of mass of landscape walls, which are of a practical natural type that grows and changes together, among the natural environments being already formed in the foot paths, could help fulfill an environment-centered value of the ecology.

Also, by actively adopting the sustainable construction theory of Soswaewon Garden and the form of Luis Barragan's vertical gardening, strollers were enabled to experience the cross section of the vigorous organic system of architectures.

Such constructing types of minimizing artificiality to achieve a balance that is based on nature's essentiality was fulfilled by the allocation of natural features that resembles the natural form.

In addition, through the continuous and circulatory landscape characteristics of accepting the substantial nature as a place for footpaths, the sustainability of space was also supported. This was because the shape of landscape walls, which could present not only nature's figurative imitations but also the application of properties as well, was essential. In other words, it must resemble the landscaping shape that is appropriate in terms of the topography, climate etc., which is naturally given to each footpath, and must form visual uniformity.

Therefore through the morphological characteristics of architectural enclosures for the metropolitan public footpath's ecocentric sense of place, we expect this research to be a vital key to the formative values for building the sense of place of pubic footpaths, which must be designed in metropolitan spaces.

References

[1] Youn-Hee, Rhee. *Study on the expressive characteristics based on eco-centric thought in contemporary architecture.*(doctoral dissertation). Dept.of Architectural Engineering Graduate School of Hong-Ik University, 2005

[2] So,Hyun-su. *An Ecological Interpretation on the Principles of Traditional Landscape Architecture in Korea.*(doctoral dissertation). Landscape Architecture. the Graduate college of the University of Seoul., 2008

[3] Park,Sung-Hee. *Study on the Ecological Characteristics of the Contemporary Architecture by the Holistic View.*(doctoral dissertation). Dept. of Architecture. Graduate School Dankook University, 2008

[4] Hwang,Yong-Seup. *Study on Placeness of Holistic Space in the light of Event and Image.*(doctoral dissertation).Spatial Design, Design Craft Graduate School Hong-Ik University, 2010

[5] Kwon,Yoon Ku. *The) formation structure and meaning of the sense of place on urban streets : research on Insa-dong and Daehak-ro within the framework of mixed-methods.*(doctoral dissertation).Interdisciplinary Program in Landscape Architecture, The Graduate School Seoul National University, 2013

[6] Hyunjeong Ahn. *A Study on the Sustainability of in-between space in city environment.*(doctoral dissertation).Bulletin of Korean society of basic design & art. vol.12 no.1 (2011. 2) pp.335-348,2011

[7] Park,Hyun Shin.*(The) effects of pedestrian environmental design on pedestrian behavior in the context of urban spatial structure : Case study on the intermediate space around the mixed-use high-rise residential buildings in seoul.*(doctoral dissertation). Urban Design&Planning, Department of Urban Planning,Graduate School Hongik University, 2013

[8] Park,Kyung-Yoon. *A Phenomenological Study on the Place Identity of the Modern Street landscape based on Relph's Theory of Place.*(doctoral dissertation). Departmenr of Art and Design, Graduate School, Deagu University, 2010

[9] Seyoung Baek. *A Study on the Visual Methodology of the Formation of Placeness- A Focus on Anamorphic Place Icons -*(doctoral dissertation). Department of Design. The Graduate School Seoul National University, 2014

[10] Yoon,Mi-ae.*Simmels und Benjamins Lekture der Stadtkultur = Großstadt und Flaneur*. Dogil munhak Vol.85 No.389-410, 2003

[11] Lee, Jin Dong. *Relation between the geographic name of "Gog" and the enclosed landscape and its scale: Case study of old villages in Jin An Gun. Korea*(doctoral dissertation). Dept.of Landscape Architecture. Graduate School of Sung Kyun Kwan University, 2010

[12] Rhee,Youn-Hee, Lee,Young-Soo. A *Study on the Connection between Contemporary Ecological-Architecture and nature.* Korean institute of interior design journal.Vol.13 No.4, 2004

[13] Kim Jihyun, Kim JooYun. *A Study on the Expression aspects of the contemporary architecture for the Development of Placeness.* Korean Institute of Spatial Design Vol.7 No.4, 2012

[14] Han Ji-Ae,Shim, Woo-Gab. *A Study on the Spacial order of Luis Barragan's Architecture*.The Architectural Institute of Korea.Vol.25 No.1, 2005

[15] Hong,Suckho.*Study on Luis Barragan's Architectural Language and a proposal of house design based on his philosophy.*(master's thesis)Dept. of Architectural Engineering Graduate School of Korea University, 2007

[16] Song,Joo-Young.*study on the architecture of Luis Barragan : with an analysis of the walls*(master's thesis).Major in Urban Design. Graduate School of Architecture & Urban Design Hong-ik University, 2001

[17] Choi,Joong-Churl.*A Study on Planning of Public Pedestrian Spaces*

for Decentralized Society(master's thesis). Dept.of Architecture. The Graduate School of Chung-Ang University,2011

[18] Kim,Seung-Hyun. *study on the analysis of visual perception of 'Jungja' in Choson dynasty : focused on the relationship with nature*(master's thesis).Dept. of Interior Architectural Design.Graduate School of Architecture,Kon-Kuk University, 2003

[19] Kim,JungHee. *A study on Architectural Design Approach Reflecting on the Korean Way of Understanding of Contemporary Urban Border Condition*(master's thesis).Graduate School of Architecture, Inha University, 2008

[20] Jin,Mi-Hee. *Study on the Characteristics of the Boundary Structure in the Space of Tadao Ando*(master's thesis). Dept. of Interior Design. Graduate School,Kookmin University, 2008

[21] Seok-Hwan Lee, Young-Hwan Kim. *A Study on Place for Overcoming the Modernity in City*, http://www.yit.ac.kr, 239p vol.2 No1,1996

[22] Lee, Ji Yeon. *Study on space design of the urban gallery on apply to the element of ecological space* (master's thesis). Major in Interior Design. The Architecture&Urban department Graduate School of Hong-Ik University, 2002

[23] Kim, Jiyoung.*Thoreau's Deep Ecological Life and Social Relations in Walden* (master'sthesis). KOREAUniversity, 2014

[24] Edward Relph. Place and Placelessness. Seoul:NonHyoung., 2005

[25] Kim, Jong-Jin. Konggan,Kongkam.Seoul:HyoHyoung, 2011

[26] Kim, Chul-Soo. Site Planning. Seoul:Kimoondang, 2007

[27] Moonsu Shin. *Ecological Thinking in Henry David Thoreau's Walden*, Vol.48 No.1 The English Language and Literature Association of Korea, 2002

[28] Yoon, Hee-soo. *A Study of the Ecological Orientation in Thoreau's Walden*, Vol.43 No.2 The New Korean Journal of English Language and Literature), 2001