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on Creative Industry

Proceedings of the 3rd ICCI 2015

“Opportunity and Challenge of Creative Industries in The Era of Global Free Trade”



2nd edition

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Foreword

ICCI is a biennial conference organized by the Industrial Design Department – Institute of Technology 10th November Surabaya. ICCI aims at providing an overview of multi-disciplinary issues of creative industries regarding the creative economy era.

The 1st ICCI was held on 11th March 2011 at Sanur, Bali, attended by 90 presenters from 30 institutions. We're pleased to inform that The Minister of Cooperative and Small Medium Enterprises of the Republic of Indonesia was coming to officially open the first ICCI. The 2nd ICCI conference was held on the 13th of November 2013 in Surabaya, East Java, Indonesia.

The 3rd ICCI 2015 is collaboration between Industrial Design Department ITS Surabaya Indonesia and Marine System Convergence Design-Pukyong National Univeristy, South Korea. It is held on 11-12 August 2015 in Bali Creative Industry Center and Fave Hotel Tohpati Denpasar, and were attended by 179 participants from 14 countries; South Korea, Australia, Denmark, United Arab Emirates, Brazil, Thailand, Japan, Portugal, the Netherlands, Taiwan, Singapore, the USA, Malaysia and Indonesia. Furthermore, ICCI can be: 1) a reference for policy makers related to creative industries, in order to exchange information on current issues and challenges facing creative industries, 2) a forum to establish a network among stakeholders of creative industries, 3) a prestigious publication channels for academics and researchers in the field of creative industries.

We greatly appreciate the partnership with Pukyong National University, South Korea in this event. We also would like to thank the Ministry of Industry Republic Indonesia (Directorate General of Small and Medium Enterprise) as our main sponsors, Pupuk Kaltim, Garuda Indonesia as the official airline of this event, ISI Denpasar, and also to our partners ADPII, DGI, BPIPI, PIRNAS, and CHI-UX Indonesia.

Bali, 11 August 2015

General Chair



**Welcome Speech
Industry Minister of Republic of Indonesia
On the opening of
International Conference on Creative Industry (ICCI) 2015
in Bali Creative Industry Center (BCIC)
Denpasar, August 11, 2015**

Distinguished the Governor of Bali, Made Mangku Pastika,
The participants of ICCI 2015,
Ladies and Gentlemen.

Assalamualaikum warahmatullahi wabarakatuh.

Om Swastiastu, May Peace and Prosperity be upon us all.

First of all, let's pray upon Allah SWT for His blessings that today we can gather here to join the opening of International Conference on Creative Industry (ICCI) 2015 in Bali.

The honorable guests,

Creative industry is one of important pillars in developing national economy.

Creative industry can empower human resources to compete in the globalization era, as well as to enhance people's welfare, that makes it a strategic consideration.

The development of creative industry in 2013 showed positive depiction, in which this sector has grown 5.76% or 5.74% above the national economy's growth with added value as much as Rp. 641.8 trillion or 7% of National GDP. In terms of manpower, this sector is able to absorb 11.8 million workers or 10.7% of national workers, followed by the number of business units that reaches 5.4 million units or 9.7% of all business units. The export activity is also considered good, reaching Rp. 118 trillion or 5.7% of total national exports.

The honorable guests,

Recently, there are 15 subsectors of creative economy being developed, namely advertising, architecture, art galleries, crafts, designs, fashion, film-video-photography, interactive games, music, art performances, printing and publishing, computer and software, radio and TV, research and development, and culinary.

Out of those 15 subsectors, there are 3 subsectors that can give dominant contributions to PDB, namely culinary sub-sector (Rp. 209 trillion or 32.5%), fashion (Rp. 182 trillion or 28.3%), and crafts (Rp. 93 trillion or 14.4%). Further about fashion and craft industries' performance, the fashion industry export reaches Rp. 76.7 trillion or increases 8% compared to the one in 2012. In line with fashion, craft industry has also got export performance leverage, reaching Rp. 21 trillion or increasing 7.6% compared to the one in the previous year.

Based on the development and the potential the national creative industry has, the strategic step done by the Ministry of Industry is by establishing Bali Creative Industry Center or BCIC. BCIC can be used by creative industry people, designers, university community, as well as related association to develop new creative products which have selling value and produce more competitive and high quality products; so that Indonesia's creative industry is able to embrace the free trade era.

Honorable guests,

In realizing that plan, one of BCIC's activities is expanding the network with national and international creative community, through the participation in ICCI.

ICCI is an international conference held every two years by ITS Surabaya which aims to accommodate and discuss the newest issues in creative industry, from various points of view and disciplines. All related parties in creative industry (creative industry people, academic people, community, Profession Association and Government) can synergize, share thoughts and build network.

As we know, the economy dynamic changes rapidly from highly depending on natural resources into depending on the capacity of human knowledge, science, art and creativity.

Back then, the strongs conquered the weaks. Today, the fasts conquered the slows. It means that creative industry must be supported by reliable information, communication and technology.

This phenomenon shows that it needs different approaches to enhance creative economy between developed countries and developing countries. The complexity faced by creative industry in each country is strongly influenced by different contexts. The different contexts are the crucial issue to be discussed both by the creative industry doer and the academic institution in developed and developing countries.

The knowledge on these different contexts can affect the policy and strategy to establish a creative industry in a certain country.

Blessed guests,

I would like to express my gratitude to all parties who help make ICCI 2015 to happen.

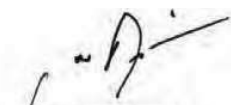
We do expect active participation from all participants so that all activities could run well. May God give His blessing to us all.

Finally, with Bismillahirrahmanirrahim, the International Conference on Creative Industry 2015 in Bali Creative Industry Center is officially open.

Wawwalamualaikum Warahmatullahi Wabarakatuh.

Om Santi Santi Santi Om. May peace upon us all.

Minister of Industry



Saleh Husin

Acknowledgement

The 3rd International Conference on Creative Industry (ICCI).

Organizing Commite wishes to express its gratitude and appreciation to:

- Directorate General of Small and Medium Enterprise, Ministry of Industry Republic of Indonesia
- Surabaya City Mayor
- Pukyong National University
- Rector of Sepuluh Nopember Institute of Technology.
- Dean Faculty of Civil Engineering and Planning Sepuluh Nopember Institute of Technology.
- All session moderator and conference speakers, for their participation.
- All conference sponsors, supporters, exhibitors and advertisers for their generous support.
- All participants and other who have in one way or another contributed towards the success of this conference.
- Premiere Sponsor and Association

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Evaluating Ergonomic Factor of *Cilaja Muncang* Vernacular Bamboo Furniture

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Abstract — Kampung Cilaja Muncang, Kecamatan Cimeyan, Kabupaten Bandung is a home for 35 industries that produce vernacular bamboo furniture. They produce simple set of furniture consist of two (2) single seat and one (1) table made from bamboo. Techniques that used and the product design never change since they started about 35 years ago. This research aim is to evaluate ergonomic factor of the products through 2 (two) approach. First, evaluation using comparation between sitting anthropometry data, standard measurement for chair and the vernacular bamboo chair dimention. The second is evaluation though Focus Group Discussion about user experience. In FGD, respondents give opinion about comfortibility and potential danger using vernacular bamboo chair. Research found that some parts of this vernacular bamboo chair caused discomfort and have potential danger. This finding could be used as platform for developing vernacular bamboo furniture new design that created by Cilaja Muncang small scale industries.

Keywords – Ergonomic, Furniture, Bamboo, Vernacular

1. INTRODUCTION

Indonesia has many potential small scale industry based on material and skill. One of potential small scale industry is in a village named Cilaja Muncang, Kabupaten Bandung that produce vernacular furniture made from bamboo. This research program conducted as part of fostering small scale industry endeavour in order to make them more sustain and establish. Design research consist of some stages. First stage is profiling craftsmen and industries, to know existing condition and development opportunity. Data profile gathered by interviewing craftsmen. Second stage is evaluating ergonomic factor of the product, that is vernacular bamboo chair. Last stage is developing new furniture design to produced by Cilaja Muncang small scale industries. This paper explained mainly the second stage which is evaluating ergonomic

factor of the product. Profile of the craftsmen and industry will explain also but in general, to give picture about the existing condition.

2. CILAJA MUNCANG VERNACULAR BAMBOO FURNITURE INDUSTRY

Cilaja Muncang is a village in Kabupaten Bandung, Jawa Barat – Indonesia. Small scale industries that produce vernacular bamboo furniture in Cilaja Muncang, starts at the beginning of 1980. At the beginning about 3 craftsmen imitate bamboo furniture from craftsmen at Girimekar, Cibejog. In 1990an number of craftsmen reach to 50. Now, about 35 craftment made vernacular bamboo furniture. Some of them stars from mid 1980, some starst 1990 and some others are just starts couple years ago.

Beginning of year 2000, craftsmen were not easy to find bamboo material from fields in

their area anymore. They starts to buy bamboo from store, that could not guarantee bamboo quality. According to the craftsmen one of quality factor of bamboo material is the harvest time. Bamboo that cutted in the morning has lower quality than one that cutted at noon.

Vernacular bamboo design never change since the beginning of industry. Craftmen sell product door to door in the area of Banten, Tasikmalaya, Pangandaran and some area in Middle Java. Craftmen goes to those area by joining empty sand truck. They goes 3 times a month. Bandung area is not their target market. Craftmen opinion that vernacular bamboo furniture design is common for people in Bandung area. With new design, craftmen could offer their product to Bandung area and attract buyers from out of Bandung.

The result of evaluating ergonomic factor of vernacular bamboo furniture research would be one of platform for developing new vernacular bamboo furniture design. Various new design and sustainable improvement will open more opportunities for individual craftman and industry. The industries could joint each other in bussiness and creating centers of bamboo furniture. Empowering design quality will attract buyers to come to Cilaja Muncang, so craftmen have not sell their product door to door anymore. Craftmens time and energy will used more efficient.



Figure 1. Vernacular Bamboo Chair produce in Cilaja Muncang

3. DATA AND METHOD

Evaluating ergonomic factor of vernacular bamboo furniture use 2 (two) approaches. First approach is comparing form and measurement of vernacular bamboo chair with sitting anthropometric data and chair standard measurement. Sitting anthropometric data and chair standard measurement taken from literaturs. Orthographic projection from vernacular bamboo furniture made for form and measurement data. Second approach is user experience research through Focus Group Discussion (FGD). FGD conducted to find users opinion about comfortibility and potential danger in vernacular bamboo chair sitting experience. User experience data collection involving 24 respodence that has percentile 50 sitting anthropometry.

3.1 Chair Standard Measurement and Sitting Anthropometry Data

Vernacular bamboo single chair classified as easychair. Secondary data taken from some literatures that compliment to each other generates Table 1. that used for comparation analysis with vernacular bamboo chair.

Table 1. Easychair Standard Measurement

Measurement	Standard Range
Seat width	40.65 – 63.5 cm
Seat depth	38.1 – 66.04 cm
Seat height	40.64 – 43.18 cm
Seat slope	5° – 8°
Armrest height	20 cm
Armrest width	5.08 – 10 cm
Seat back height	30.48 – 40.65 cm
Seat back recline angle	10° – 15°

Sitting anthropometry data taken from Allsteel (2006) percentile 50 and Pheasant (1996) as comparation. Both data are Eropean

anthropometry. Asian anthropometry measurements are 3-5 cm less than European.

Table 2. Sitting Anthropometry (cm)

Measurement	Male	Female
Sitting height	91.3	85.25
Buttock-to-knee	61.85	59.05
Knee height	58.95	54.6
Seat length/depth	49.25	47.35
Popliteal height	46.47	41.91
Seat width	39.5	41.25

3.2 Focus Group Discussion

FGD session started with measuring respondent sitting anthropometry. Respondent sitting anthropometry connects with user comfortability and the potential danger. Other than sitting anthropometry, respondent data also includes sex, age, and course taken. Primary data collected through focus group discussion (FDG). FDG participants are 24 Product Design Department and non Product Design Department students from different levels. FDG implemented in 6 (six) groups, each consisting of homogenous 4 respondents. The first group is Product Design students who complete Ergonomic 1, Ergonomic 2, and Furniture Design courses. The second and third groups are Product Design students who complete Ergonomic 1 and Ergonomic 2 courses but not Furniture Design. The fourth group is Product Design students who did not take Ergonomic 1, Ergonomic 2, and Furniture Design courses yet. The fifth and sixth groups are non Product Design students who do not know about ergonomic design.

Four (4) vernacular bamboo chairs were placed in a FGD room. Respondents sit at each chair and try some position that is comfortable for them. Respondents give opinions about user comfortability and the potential danger. They also point to parts of the chair that are uncomfortable or potentially dangerous. The first

group mentions that seat construction is not strong enough and the middle part of the seat structure caused discomfort. The back seat is better higher and the upper structure caused discomfort. Armrests are too low. The chair's leg front horizontal structure is disturbing. The potential danger caused by the structure ends. The second group said that the seat is not wide enough. The back seat reclines too much and the upper structure caused discomfort. The joining part between the seat and back caused discomfort. Armrests are too low and the armrest diameter is better bigger. The diagonal structure at the chair's leg is potentially dangerous. The structure ends are too sharp. The third group comments that the seat height is too low, the seat is not deep enough, the back seat is too low and not bright enough. The back upper structure caused discomfort. Armrests are too low. The fourth group mentions that the seat is not wide enough. The back seat is better more reclined. The joining part between the seat and back caused discomfort. Armrests are too low. The chair's leg front horizontal structure causes discomfort for the foot step. The fifth group mentions that the seat depth is not bright enough, the seat height is too low. The back seat is better higher. Armrests are too low. The joining part between the seat and back caused discomfort. The diagonal structure at the chair's leg is potentially dangerous. The sixth group said that the seat discomfort is caused by the middle structure. The back seat is not high enough. The diagonal structure at the chair's leg is potentially dangerous.



Figure 2. Normal sitting position in FGD



Figure 3. Layback sitting position in FGD



Figure 4. Free sitting position in FGD

Discomfort and the potential danger points from FDG classified as seat discomfort, back seat discomfort, armrest discomfort, and the potential danger are at the structure ends and diagonal structure at chairs leg.

Tabel 3. Vernacular bamboo chair discomfort

Object	Discomfort
Seat width	Too narrow
Seat depth	Not deep enough
Seat height	Could be higher
Seat slope	Middle to sides (caused by mid structure)
Armrest height	Too low
Armrest width	Better wider
Seat back height	Could be higher
Seat back recline angle	- Could be more recline - Too reclined

4. ANALISIS

FGD shows that vernacular bamboo chair has some problem in ergonomic factor. Comparing form and measurement of vernacular bamboo chair with sitting anthropometric data and chair standard measurement also shows that vernacular chair form and measurement does not match with easychair standard measurement.

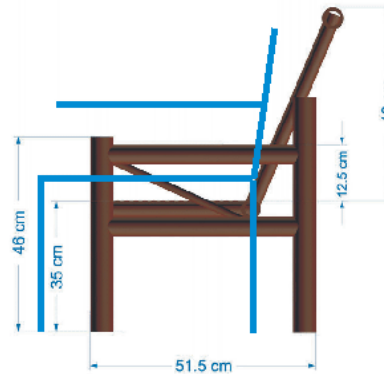


Figure 5. Comparing side view vernacular chair with easychair standard measurement

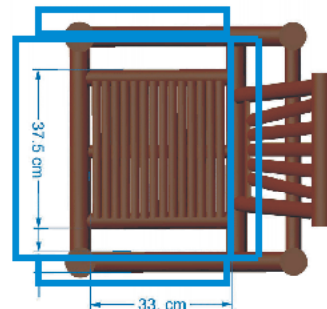


Figure 6. Comparing top view vernacular chair with easychair standard measurement

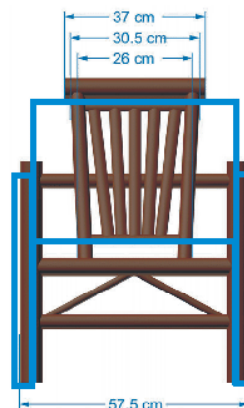


Figure 7. Comparing front view vernacular chair with easychair standard measurement

5. RESULT AND DISCUSSION

Comparison analysis between vernacular bamboo furniture measurement, sitting anthropometric and chair measurement standard also FGD result shows that vernacular bamboo chair does fits with ergonomic standard. Some parts and construction detail of the chair needs to develop to fits with ergonomic standards. This research will run with some more FGD session that take lecturer and staf as responden. Those FGD session data will sharpen this second stage research.

Following this second stage research will be a workshop to share this research result. Craftmen will be the workshop participants. Through the workshop, craftmen will understand lack of their product and knowing the potential to develop. Third stages of this research is design development or research through design. Design development aims to produce design alternatives that conciders to ergonomic and human factor. Whole research will ended at November 2015.

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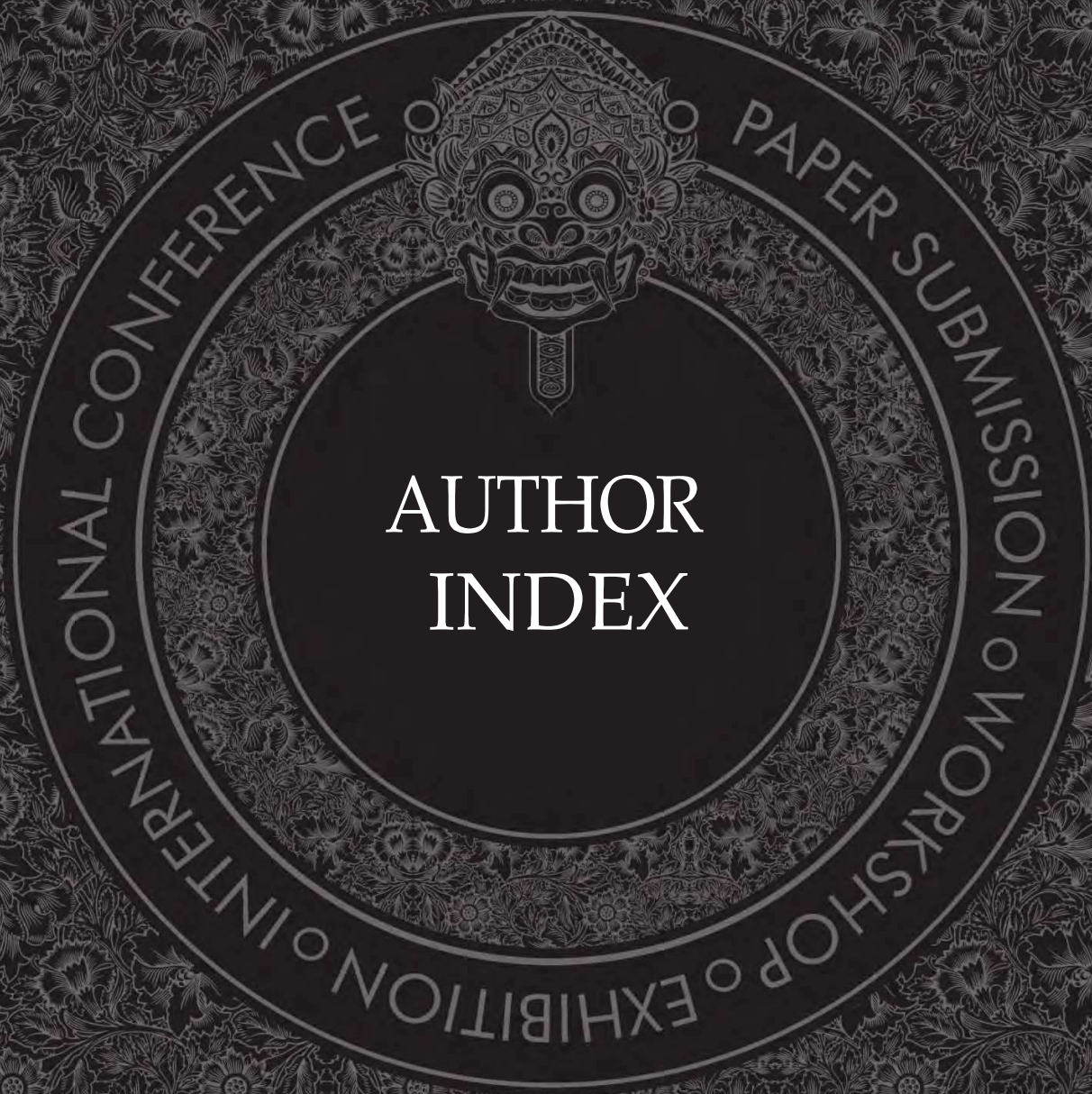
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