

COLOUR AND VISUAL PERCEPTION: EXPLOITING VISUAL PERCEPTION OF COLOUR, IN TRADITIONAL 'LAKSHA' PRODUCTS IN SRI LANKA.

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Abstract.

Design decisions behind colour compositions of a product, play a major role in communicating an identity, purpose and functionality of a product. Also, how this particular product would fit in with what's around it. When considering a multicoloured object; change in colour choice and compositions has a great potential to impact the visual perception an object. The Visual perception of a product is the main factor considered in this research; functionality, usability and socio-cultural factors are omitted. The exploration limits only to five case studies of Kandyan era 'Laksha' products found at Colombo and Kandy National museums. The methodology of research is based on qualitative methods. In order to evaluate "how multi-coloured objects are visually perceived with regard to 'Laksha' products", a common ground was established on how humans visually perceive. For this purpose, secondary sources of biological, psychological and physical aspects of visual perception and theories related were used to build up the theoretical background for the research. With this background, images of 'Laksha' products were made in to primary graphics and then dissected into different graphics (Secondary graphics); which are analysed to understand how they are perceived visually. The dissected graphics are used as tools in the study. These graphics of the visual perception of multi coloured 'Laksha' products will be used as a stepping stone to discover the fossilized contextual creative knowledge regarding the use of colour in design. Moreover, the methodology of the study implies many future studies and possibilities.

Keywords: *Visual Perception, Colour, 'Laksha', Evaluation*

1. Introduction

"Colour is often treated as an afterthought in the design process and colour specifications are rarely mentioned in the briefing stage when it comes to industrial practice of product design. But it is obvious that use of colour is as important part of design alongside form, functionality, technology and finance." (Russell, 1991) Colour and all other elements of design are intertwined and when it comes to their impact towards a product visually and semantically, colour is as important as any other element of design. For colour to be a part of the process in designing and to understand how one could use colour impactfully much research and experimentation is yet to be done. This study sparks with these observations in mind. Considering traditional products in Sri Lanka, 'Laksha' products are quite noticeable. Also composes a verity of multi-coloured patterns mesmerizing a play between the colours and the shape, form of the objects. In order to understand this impact of colour, the focus question of the study arose; "How multi-coloured objects are visually perceived with regard to Kandyan era 'Laksha' products?". When considering the 'Laksha' crafts and products in Sri Lanka from centuries back, they seem to have an originality and attention to detail in use of colour, which seems to be lost along the way. The study of visual perception of 'Laksha' products is an initial stepping stone to revision use of colour in traditional 'Laksha' crafts and to capture the thinking behind use of colour. This has the potential to be integrated with modern-day industrial design and as well to uplift a decaying craft sector.

2. Perception, Visual Perception and Gestalt Psychology

2.1. IDENTIFICATION ON BASIS OF VISUAL PERCEPTION

"Visual processing happens in many areas of the brain. Our visual perceptions appear to be produced by cells which fire on a hierarchical basis, coding from simple to more complex features." (Morin, 2016)

2.1.1. Constructive Perception

The Constructive Perception explains; visual perception is created primarily by capturing, comparing and analysing the stimuli with already encoded information in memory and this process is operated below our level of consciousness. As a result, it is commonly referred to as a bottom-up perspective as

well. (Morin, 2016) Prototype theory is a concept that suggests our brain does not need a perfect match, but rather it will search for the closest match to a prototype (i.e. abstraction of templates) before it produces a complete percept. (Neumann, 1977)

2.1.2. *The Direct Perception*

This view states that all perceptions are produced by the directly obtaining information from the environment at any given time. Direct perception is regarded to be more primal or instinctual. (Morin, 2016)

2.1.3. *Integrative view of visual perception*

Through neuro-scientific research states; information is rather organized as a distributed system. (Morin, 2016) Also these recent studies suggest that visual percept is not necessarily produced via constructive or direct perception theories, but the brain may be able to handle and process information both ways through specific areas of the brain. (Warrington & Shallice, 1984)

2.2. GESTALT PSYCHOLOGY

Gestalt psychology affirms that there is a simplification happening in the mind in order to understand the visual environment and the mind tends to reduce the subject matter in the visual field to the simplest regular shapes. (Ching, 2014) Emergence, Reification, Multistability, and Invariance are the key aspects of Gestalt psychology and they are mostly regarded as different aspects of a single unified system and not necessarily as separate modules (Lehar, 2003)

2.3. GESTALT PRINCIPLES

The fundamental idea of the Gestalt perception is the “Law of Pragnanz” (in German language, pithiness). Core idea of Pragnanz is that the mind tending to order the experiences in a regular, orderly, symmetrical and simple manner. (Sternberg, 2003)

Gestalt principles include Closure, Common fate, Constancy, The Figure-Ground Relationship, Good Continuation, Law of Pragnanz, Proximity, Similarity and Symmetry. (Lidwell et al., 2010)

3. **‘Laksha’ Crafts in Sri Lanka**

Lacquer is a material that produced in South and East Asian countries. It considers as a durable, glossy, water and heat resistant material. This natural material is produced from the sap of a specific type of lacquer trees. *Laksha’* crafts were practiced in Sri Lanka with great heritage with native methods of *‘Laksha’* preparation and finishing (Coomaraswamy, 1979). *‘Laksha’* products mostly include wooden appliances such as food containers, ornaments, ceremonial accessories such as “*Sesath*”, etc. Lac industry was given a higher position by the ancient Sinhalese kings to uplift the industry. *‘Laksha’* workers and painters were named as *‘Lokuruwan’* and artists at this time (Vithana, 2010).

3.1. PRODUCTION PROCESS OF ‘LAKSHA’

The cut pieces of hale wood which are seasoned, then turned into curved shapes from the lathe machine, chisels and other tools. Before the introduction of motorized lathe machine, Sri Lankan craftsmen used a device called “*Sakaporuwa*” where two people are involved in. Lathe machines, defines the form of the object to be radially symmetrical. There are two basic methods of application in *‘Laksha’*. In “Working with nails (*Niyapothu Weda*)”, initially lacquer is applied with use of a Talpiot; a Lacquer string made by pulling of heated Lac, the process includes placing and pushing by the index finger and the nail of the thumb; hence the name. Later it is polished with Talpiot. In “Works in Lathes (*Pattal Weda*)”, a hand operated lathe machine is used which rotates the object back and forth. On the rotating object, Lac is rubbed and patterns are added by scratching on the precise layers of colour. When adding colour, prepared *‘Laksha’* is heated and then mixed with the colour pigments (Traditionally; Red: *Sadilingam* Powder, Yellow: *Gal Hiriyal*, Black: smut).

4. Visual perception of multi-coloured ‘Laksha’ Products from Kandy and Colombo Museums

4.1. SELECTION OF CASE STUDIES

Products that are in the National Museums of Colombo and Kandy were selected to avoid the present-day colour compositions; but to get products with natural pigments of colour and genuine native thinking in application of colours. Following limitations were also considered when selecting the Case Studies.

- Only the wooden products were selected – to avoid different shades in colour and different textures.
- Many of the products were avoided due to discoloration and damages.
- Products with decorative motifs and engravings were also avoided to make sure the products selected remain much similar.
- Only the products that were crafted with the use of “*Pattal Wada*” were selected, in order to limit any variations in form and to focus on similar group of forms.

4.2. INITIAL GRAPHICS AND COLOR SELECTION FOR GRAPHICS



Figure 1 : selected case studies from kandy and colombo museums. (Source : Author)

Since the human mind tend to perceive and understand simpler, more regular forms in any given composition, the photographs of the case studies selected were made in to 2D (flat) graphics. Only the side elevations of the graphics were selected as it was the most suited view to capture the colour patterns. Also, since all the case studies are made from “*Pattal wada*” method, the objects are radially symmetrical; producing a symmetrical side elevation with horizontal line patterns. Gestalt psychology discribes lines and colour lines on three dimensional ‘*Laksha*’ products to be perceived same as the lines and colour lines on 2D graphics. As Invariance explains, that it is possible to identify objects despite any change that happen as elastic deformations and change in scale. When three-dimensional object made in to 2D graphic, the changes that will appear are mostly the change of brightness, value of colour and the shape of the coloured lines towards the edge of the silhouette; which would be perceived as unchanged due to constancy.

4.2.1. Colour selection

For the developments in Graphics, colours were selected from the photographs of the products that were selected. These products, being made in the Kandyan era (18th century and prior), have been damaged

and discoloured over time and hence the shade of the colour will differ from one product to another. Considering freshly lacquer applied products and antiques, colours were selected and final colour selection was done. These selected colours are the colours that are used for the development in graphics for the study and they will be referred to as Black, Red and Yellow respectively.



Figure 2 :Colour selection of Case studies (source: author)

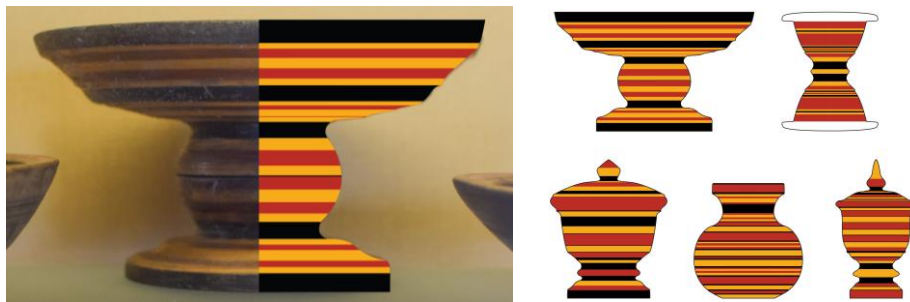


Figure 3: 2D Primary graphics of the case studies; illustration (source: author)

Since the graphics in different backgrounds are perceived differently background is regarded constant (white colour) for this study.

5. Secondary Graphics based on visual perception of colour

Considering that the perception is a constructive process, the graphics represents the possibility of smallest building blocks when perceiving a multicoloured ‘*Laksha*’ product. Multistability (the tendency of ambiguous perceptual experiences to pop back and forth between two or more alternate interpretations unstably) and Figure Ground Relationship with in gestalt psychology breaks down, each and every element with in the perception. Hence when considering the perception of colour with in the simplified graphics. Graphics are dissected as bellow based on visual perception of colour. It could be also stated that; the rest of the Gestalt Principles (e.g.- closure, similarity, proximity, good continuation) are the ones that enable us to construct the complete perception.

5.1 FOREGROUND GRAPHICS

After making up the illustrations from the images, considering all the gestalt principles (mainly figure ground relationship and similarity) the graphics were converted in to separate set of graphics as they will be perceived separately depending on the colour (perception of yellow, red and black separately).

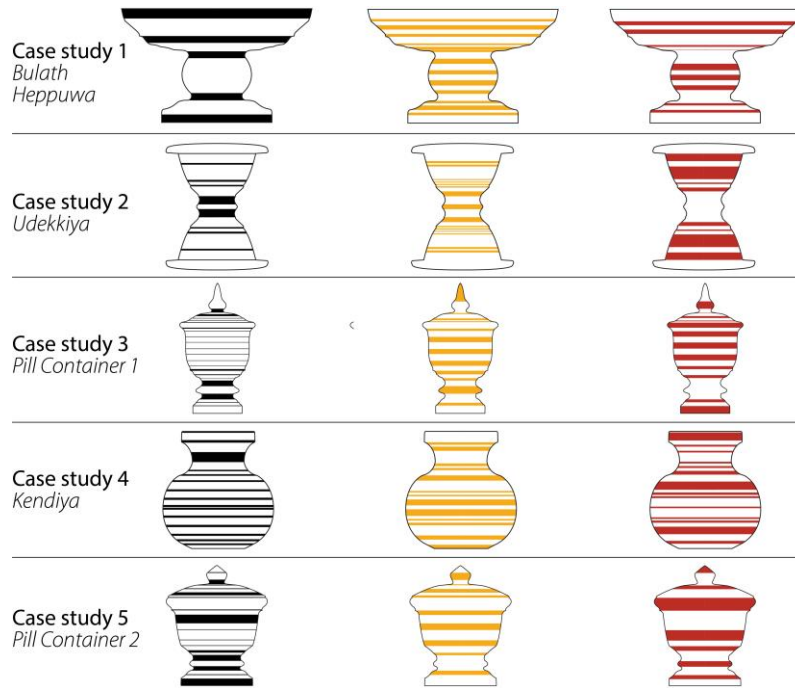


Figure 5: Analysis of Foreground Graphics (Source: Author)

The single colour graphics isolates the colour and in the process of visual perception understood by constructive framework these singular elements of colour are responsible for the mesmerizing effect of the whole composition.

5.2. BACKGROUND GRAPHICS

Similarly, when any colour becomes the fore ground the other two becomes the background.

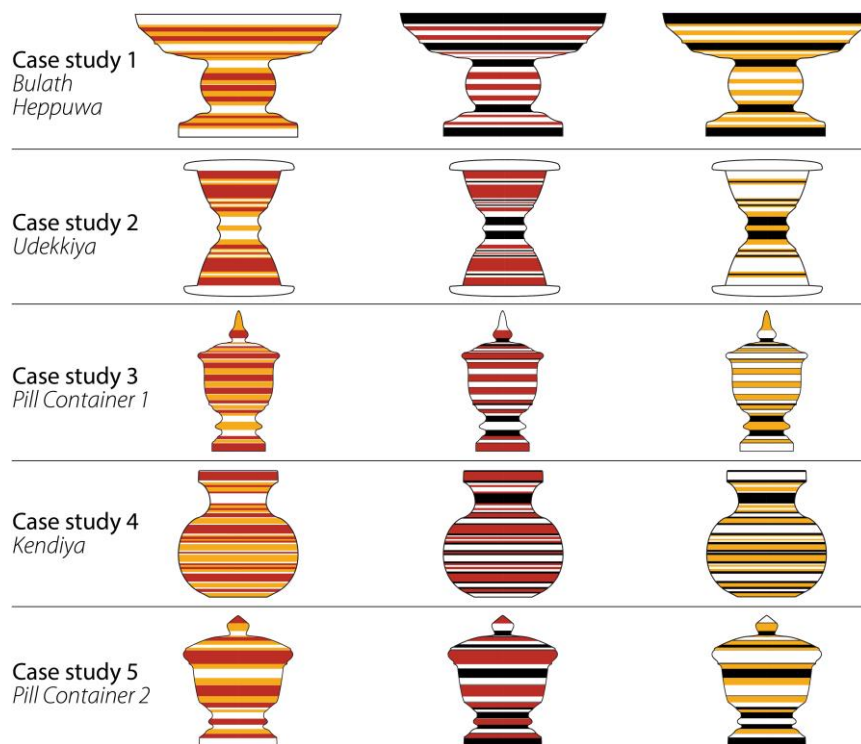


Figure 6: Analysis of Background Graphics (Source: Author)

These graphics are a result of the fore ground selecting in process of perception. But as constructive perception states humans simplify in to the simplest elements and hence these graphics are yet to be simplified creating again the fore ground graphics above. Therefore, it is evident that these graphics are not actually perceived in the most bottom level of perception. But when moving up in the constructive frame, these graphics will appear with the continuous switching back and forth due to simplification and dissections of the whole composition.

5.3. GRAPHICS WITHOUT OUTLINE

Considering above mentioned aspects of gestalt principles, perception of colours separately also enables closure to create form through coloured lines. In order to identify how coloured lines impact Closure of the object’s form, the available graphics were further developed by eliminating the outline of the graphics.

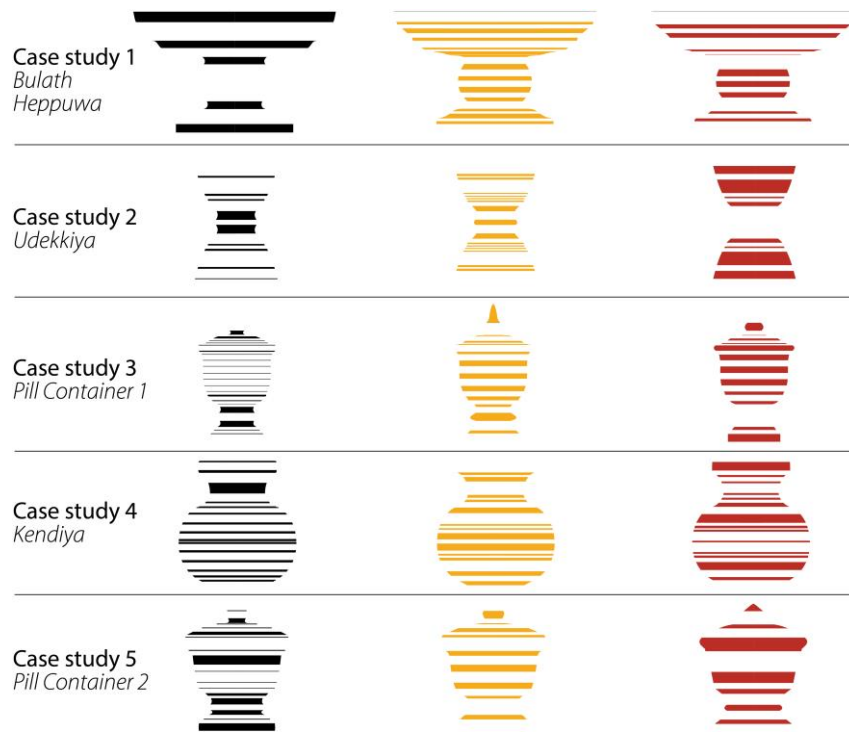


Figure 7: Analysis of Graphics without outline (Source: Author)

Regarding the original form of the case studies, it is observed that most of the time there is a single colour which supports perception of an accurate form; compared to other two. This effect is clearly visible in “*Bulath Heppuwa*”; where yellow contributes mostly towards continuation of form. Similarly, it is seen that red colour does very little towards maintaining form in “*Udekkiya*”. Comparison of background graphics and these it is seen that the black rarely has any impact on maintaining form through closure. Thin lines of black are merely to highlight the yellow and red and takes less prominence in the whole composition.

5.4. MONO COLOUR GRAPHICS OUT OF COLOUR SEPARATED GRAPHICS

In order to capture how line patterns are distributed without considering them as coloured compositions; the coloured graphics of yellow and red are turned into black.

Mono colour enables the understanding of each colours’ distribution without and disorientation caused by colour. ‘*Udekkiya*’ clearly has an equal horizontal symmetrical distribution in colour while on ‘*Kendiya*’ the line of symmetry is dragged towards the bottom of the object. Also, this distribution of the pattern sometimes changes from colour to colour in the same object often.

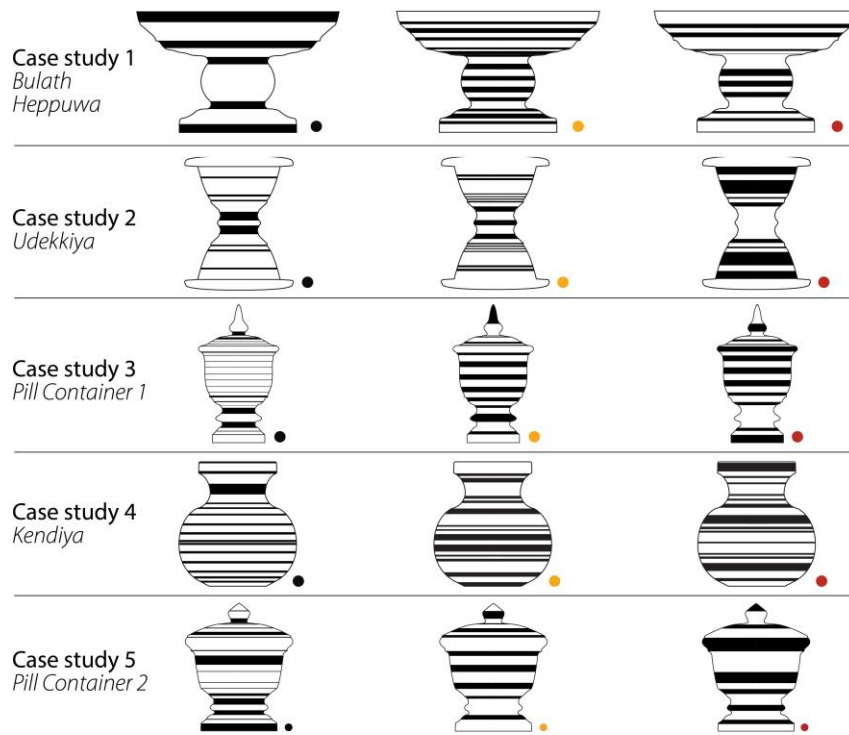


Figure 8: Analysis of black and white Graphics (Source: Author)

5.5. GRAPHICS WITH RELATION TO FORM

Furthermore, with principles; good continuation, similarity and proximity enabled dissecting the initial graphic with regard to form. The nature of the form of the product (as it's manufactured in the lathe machine) results forms which extrudes; outwards from the centre axis (extruding forms) and the forms which narrows down towards the centre axis of the object (narrowing forms). Other than these the top most form and the bottom most form was considered separately. On some occasions the top form or the bottom form could also be an extruding form or a narrowing form as well.

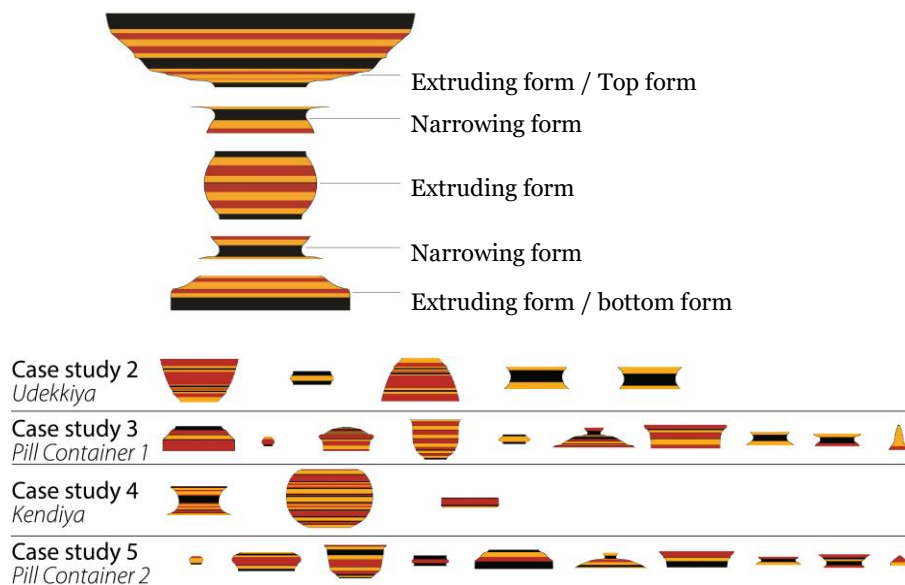


Figure 9: Analysis of Graphics with relation to form (Source: Author)

Colour distribution and usage with regard to form; could be identified in here. Considering the whole object, extruding forms are with more space and also with multiple lines where as compared to narrowing forms with most of the time thick black line. Distribution of colour and also pattern and thicknesses of the lines dramatically change with the form they are applied on.

5.6. OVERVIEW OF THE OBSERVATIONS AND DISCUSSION

Dissected graphics of the selected case studies express basic identification of the simplest units and their combinations. Is the first step to impact the whole aspect of the aesthetics; and, to identify the potential motives behind these created compositions. Hence the thinking behind 'use of colour' and also the impact created with colour is an exploration of 'Native identity in colour use'. But in order to capture the whole idea, use of colour should be thoroughly studied considering the emotional cultural and social aspects as well. Studying the shades of grey and corresponding tones, yellow is the highlight among the three colours that are used. Black being the shadow and the red being median grey. Adding a black frame or an outline on a hue will constrain its visual presence, as if black is compressing the hue and white will swell the hue. (Bleicher, 2012), the black and the highlight (yellow) impact the red and each other to appear differently. These effects are much more exaggerated by the saturation and brightness of these colours. With the narrowing forms (on Graphics with relation to form) most of the time black is used at the narrowest point in form between two stripes of the highlight; creating an even narrower percept of the narrowing form. This is done similarly with the extruding forms as well; using yellow at the most extruded point in between two black stripes. Also, minimum use of thick black lines on the extruding forms supports the same effect.

Use of a simple analogous colour harmony (warm colours) makes the differentiation or switching back-and-forth between the colours (single colour graphics) much intense due to low contrast between the colours and familiarity of the harmony. Use of black and white or more contrasting colours would make the differentiation between the colours much easier and hence not an intense switching of precepts. Use of simple shapes of colour also supports the same motive. Same shapes same harmony and differentiation is kept minimum to the low contrast between the colours.

The study of Mono colour graphics and background colours resulted observation of red and yellow being the prominent colours on the composition and they are the ones that contributes towards creating a pattern. Black is observed to be only a tool to increase luminosity of other two colours.

7. Conclusion

The overall reading of graphics extracted of the above discussion suggests that there are three forms of interpreted rationales in the use of colour that are observed.

- Use of colour to amplify extrusions and non-extrusions of form.
- Use of less contrasting colours and similar extents of colour for intense waving between colour separated precepts.
- Use of black to enhance Luminosity of other colours used.

The graphics extracted of the initial graphics, represents the deconstruction of the visual percept of colour of those case studies selected. The theoretical background and supportive material would be of use in expanding the range of case studies for further studies. The use of colour in patterns and us of colour with integrated motifs are further studies.

Similar to the observation made with the case studies 2 and 3 regarding symmetry of line patterns; 'Exploration of thinking and the applied principles to build up the rhythm, balance and etc; behind patterns created with coloured lines' is also possible with these extracted graphics. Prominence of use of colour with relation to form, use of colour in different colour thicknesses, impact of colour in scenarios of use based on case studies and impact of differentiation in background colour are few of the possible studies out of the already colour separated graphics.

The consideration of socio cultural and emotional factors and responses on the analysed case studies focusing on overall perception of colour rather than visual perception would deliver a vast understanding on the native thinking patterns in use of colour. Moreover, thinking forward from this study; the change

of colour hue and impact, experimentation of colour use in different forms, application and experimentation of interpreted rationales could be tried out. Also, this study could step in on attempting to uplift, secure and to help move forward the 'Laksha' craft sector in Sri Lanka.

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