



DESIGN CONCEPTUAL AND ANALYSIS OF TIE AND KNOT TECHNIQUES USE IN  
PRODUCT, FURNITURE AND DECORATIVE ART



A Thesis Submitted in Partial Fulfillment of the Requirements  
for Doctor of Philosophy DESIGN ARTS (INTERNATIONAL PROGRAM)

Graduate School, Silpakorn University

Academic Year 2020

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Title                    Design Conceptual and Analysis of Tie and Knot Techniques use in  
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By                        Korakot AROMDEE

Field of Study        DESIGN ARTS (INTERNATIONAL PROGRAM)

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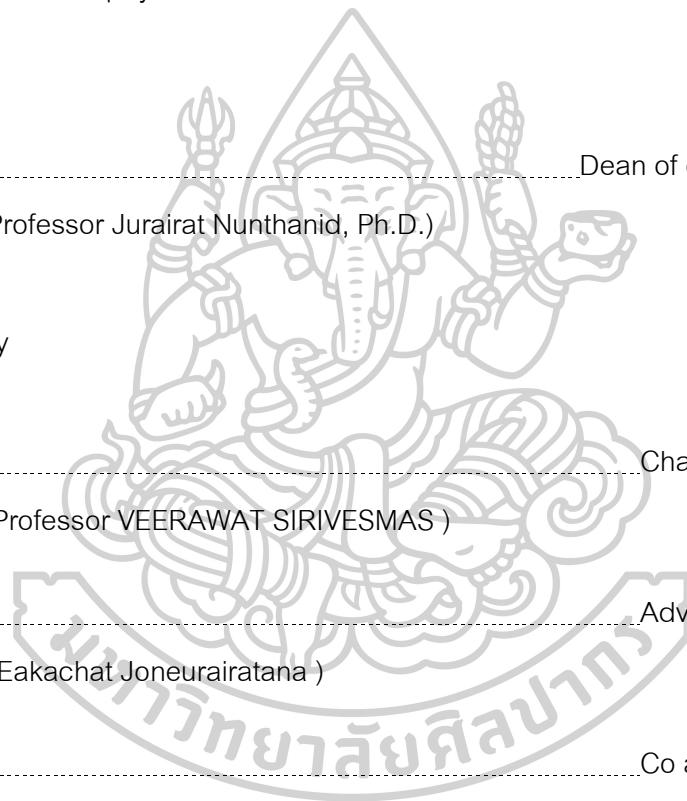
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MR. KORAKOT AROMDEE : DESIGN CONCEPTUAL AND ANALYSIS OF TIE AND KNOT TECHNIQUES USE IN PRODUCT, FURNITURE AND DECORATIVE ART  
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What factors retain the knotting and tie local craft heritage and valuable in daily life and economic benefit? The fishermen's lifestyles focused on the interest of living with muddy slopes along the seaside area. Such traditional skills and techniques of tying the rope with various knots to the bamboo trunk, which can absorb and withstand the natural wind and wave force, is a method preserved to create a catcher. As a daily routine by bringing food in the household, a learning culture combined with practices as if the crafts become a natural seasonal translation resulted in memories, records, adapting, applying methods, making different ways, and adapting as a tool designed to sustain a living. Therefore, the decoding of ancestry wisdom and common routine practices, to a combination of procedure techniques, and suitable materials, would require creating a contemporary craft design with sustainable products worthy of higher quality for future development. Since handicraft variation in various regions is scattered with specific quality and market needs, the producer must develop to support the commercial growth and success for pertaining cultural preservation as well as responsibility for the environment. This research intended to develop contemporary art and design perception and value from a tie and knotting with an appropriate material such as bamboo ligament. The objectives have committed to investigating the original Knotting history and process, including the related material for knotting such as bamboo, rope and paper. This paper used the Practice Led Research approach as the primary method for this dissertation with mixed research objectives. This research provided the method and process of used tie and knotting to create creative decoration furniture by divided into four phases: exploration, inspiration and ideate, implementation, and delivery. The research result provides a context of Thai craft and folk arts, wisdom of knots and tie. Also, explain the importance of the arts aesthetic for creative craft and

creative design. To clarify the relationship between handicrafts to contemporary designs and created the new design process model. This paper also demonstrates how to shifted local handicraft to contemporary designs. To sum up, this research will increase handicrafts in the local Thai community and preserve the Thai local.



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Korakot AROMDEE





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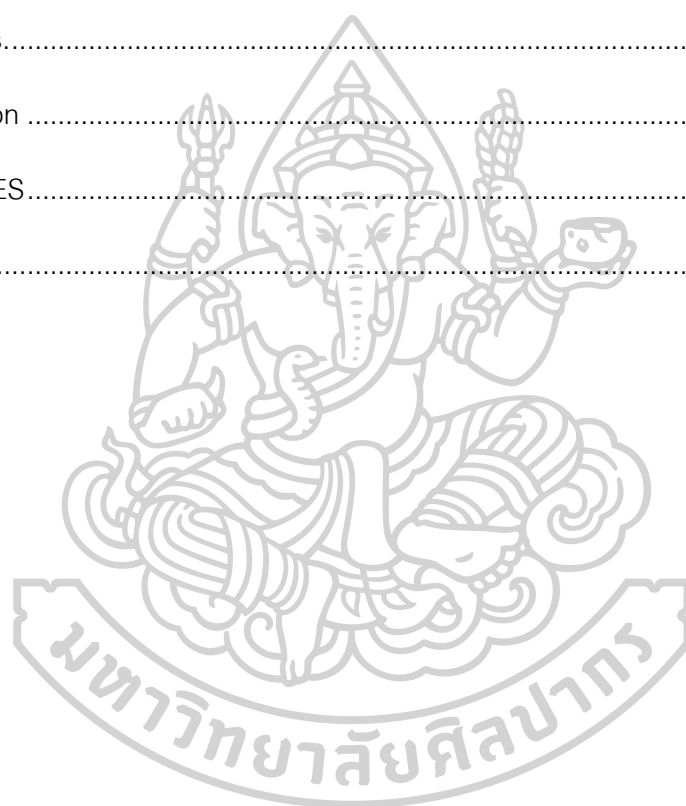
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## Chapter 1

### BACKGROUND OF THE STUDY

#### 1.1 Background and the significance of the research

The fishermen's lifestyles focused on the interest of living with muddy slopes along the seaside area. Such traditional skills and techniques of tying the rope with various knots to the bamboo trunk, which can absorb and withstand the natural wind and wave force, is a method preserved to create a catcher. As a daily routine by bringing food in the household, a learning culture combined with practices as if the crafts become a natural seasonal translation resulted in memories, records, adapting, applying methods, making different ways, and adapting as a tool designed to sustain a living. From living nature Come to life by producing four factors for sustenance Human beings, therefore, create "Crafts" (Crafts, Handicrafts) as a means of living (Suwan Kongkhunthian, 2020). Toolmaking utensils are aligned with the notion of the catch. Using the terms for making sea life catchers, building shelter, fishing boat tether, making utensils for drying fish for storage or for preserving food. Moreover, making wreaths and bindings to make beliefs, medicine and faith until every four requisites is fulfilled (Suwan Kongkhunthian, 2020).

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Local wisdom methods that allow the new generation to accentuate a current contemporary handcraft creative process can be a challenging task and perhaps needs a systematic thinking process to contextualize. Especially, the interest in technique employs by the fisherman in which the art of rope tying with variation of knots and rope, helps thinking through the combined local natural materials to create a new idea. Current synthetic materials extend the possibility of material strength, thus benefited the larger tools used to ease previous heavy work load. In addition to existing woven and tying methods, creating fishery equipment such as tether, Inuit, or netting employed the knotting skills to build and secure the vital feature of the necessary equipment. This knowledge appears for use in other type of non-related tools of which traditional toy as Thai's kite (Jula) and (PukPow) or to the design of household furniture that transfer the advance tying style in various form considered for creative product, furniture, and interior design, as well as for wall to ceiling decoration.

Material selection is an essential component that needs research to validate its use and design, of which to help indicate type of materials suitable for production. In traditional design, bamboo as a main choice of material, based on its flexible physical property. Thus, further its use because of its woven quality, which highly considered as a popular choice of natural material in craft-work and naturally of its wide availability plants in all regions of the country. For each type of bamboo, such as “golden bamboo” where its practices for design of woven products based on its texture appearance, thicken straight fibrous stem, “long stem bamboo” a medium size tender fibrous trunk found in the northern region where popular for use in basketry, boxes, and fastening system; and “giganteas bamboo” with large straight stem without thorn (Suwan Kongkhunthian, 2020).



Product and interior design along with creative arts, which utilize the bamboo tying and kite making technique were transferred from the ancestor to today research and additional synthesis process, which create new knowledge, enhancing the context of the art of knotting and tying with natural fiber. As we return to using local material such as bamboo and natural rope that idea might improve the home decorating practices. Thus, it helps to indicate cultural community in generating creative process at a local level in which to increase a job opportunity based on general and familiarized local wisdom for its fundamental process. Leading to how this process reoccurred and generated an in-direct connection to simplicity and genuine lifestyle.

Within this familiar community setting, life and career related to sea-life offered a chance to become acquaintance and learn as well as to practice the tying crafts' benefits in everyday activities: such as boat ropework, Inuit netting, tying drying fish rack, and tying commercial vehicles covers. This practice is considered to be a common routine within the community that each technical task required various techniques. As such, a community elderly will possess a certain skill in rope tying where for kite knots can be perfected to have a similar tying feature like the knot for fisherman. In such case, the local master (Researcher's grandfather) held a specialized skill in kite tying, but the tying skill that resembled the fisherman knot, to reveal to have less complicated tying procedure than its predecessor. This direct knowledge passed down to the researcher, whereas inspired the researcher own creative work based from tying technique toward the art creation, decorative installation, products, and other community's creative projects. Eventually revive the traditional tying techniques to educate the locals to continue the original skills in practices and learning of tying crafts.

From the direct experience in kite structure and tying technique, the Jula and Pukpoung kite artistry, became the choice of using simple knot and materials based on bamboo and rope. These two selected materials lead to further analysis in woven crafts, seaman netting, agricultural tools, as well as furniture. All mentioned hold an explorative possibility from the indigenous level to the development where the researcher

demonstrated the methods and providing the materials categorization idea to the use of product reflecting the setting and the level of water. However, the way of employing bamboo for weaving basket and art pieces, must reconnect, described as the material choice, represent the valid structure when woven, bamboo is now targeted as wonder materials, with multiple purpose used by local in various manners of which comprised of different fiber structure and numerous characteristics. Not that bamboo becomes less effective in the design industry, but the core of its quality lies within the keen use of the fiber, thickness selection, where the spinning technique by the local will eventually reveal the bamboo true nature of its benefits.

Bamboo is a meaningful and beneficial material to human, with attribute perceived as the leading choice of natural local materials, with recognition of crafted wisdom to professional knowledge such as agricultural profession, tribal study, or other branches of Thai's culture venue– its reputation leaped forward with supportive technological advancement to prolong the material with its adaptive use. This research complies various studies to enhance the physical property and raise the interest for its adoptive application for design. Elaborative investigation for regional bamboo family and descriptive experimentation of this research have geared toward bringing the tying technique to generate the identity that apply for future design methodology and creative processes.

## 1.2 Problem Statements:

To provide a context of Thai craft and folk arts, wisdom of knots and tie also to clarify the relationship between handicrafts to contemporary designs. This research goal needs an appropriate design process to demonstrate the value of wisdom from ancestors and step by step manufacturing processes until it can be passed on to knowledge that the future generations can apply in contemporary design. In addition, how to preserve traditional crafts? Form the research problems the main approach for crafts conservation it can be possible in two ways together.

Firstly, served to maintain knowledge with the understanding of the importance of keeping knowledge as self-worth regardless of the immediate benefits that can arise, for example, this approach has been applied in a manner worth mentioning in Japan. The government recognizes the historical value of activities such as drama, music, techniques, crafts, which guarantees protection and legal preservation. Artists and craftsmen with unique skills are recognized as They are "living national treasures" and receive annual compensation in order to continue managing their crafts and to train their successors and pass on the legacy. In addition, the state conducts workshops to ensure knowledge transfer between generations. Which is in the same style as Thailand.

Secondly, using traditional crafts to gain profit and to preserve the local craftsmanship. In this case, crafts are made for trade or tourism. This approach is applied in many places around the world it is clear that handling crafts for commercial purposes is often taken as a starting point, from the very beginning to the market demand. And draws on traditional social and cultural contexts as well as traditional qualities expressed in the form of design symbolic colors and more. Under this situation it is very difficult to maintain the validity of conventional wisdom. Although it is reasonable to keep the traditional way of working. In other words, even if the final product loses its traditional properties. But the manufacturing method may be similar to that of a traditional product. This claim is not true in all cases and raises the question of whether are "some similarities in manufacturing methods" enough to constitute a preservation of craftsmanship?

A preservation point of view gives importance to the conservation or innovation of traditional handicrafts for cultural values. In contrast, a commercial view emphasizes the adoption of traditional handicrafts for better production capacities for better economic sustainability. Unfortunately, these contradictory viewpoints appear to hinder sustainable development of the entire sector. Besides, both methods share a common problem, which is an unsteady demand for handicraft products

1. To explain the importance of the arts aesthetic for creative craft and creative design.
2. To clarify the relationship between handicrafts to contemporary designs.
3. To demonstrate traditional handicrafts to contemporary designs.
4. To develop the technic of knots and ties style in creative design.
5. To promote handicrafts in the Thai local community.
6. To obtain knowledge and develop creative handicrafts to the world.

Indigenous cultural heritage consists of three main categories: Folk literature and folk art Which is considered to lead the spirit and emotion of the nation Technological changes that have taken place across the country over the past hundred years have resulted in the disappearance of traditions and work, especially those involved in the transformation of local folk arts such as fisherman's knotting. It still occurs on a very small scale, for example, some fishermen hand-tied knots in Thailand that are still available, such as in Phetchaburi Province. Chonburi province and some people have already disappeared. These crafts are very little documented and there are few that mention things that are not actual manufacturing methods.

Proper choice of materials is considered the initiative step toward systematic experimentation. Various type of bamboo in Thailand grown in mountainous region and brought into daily life throughout history. Naturally, for the elderly pertained the experience and knowledge in weaving that passed down from a generation to others. Several woven pieces used bamboo to create and increased a special quality design for children, but not for commercial purposes, which perhaps several pieces were donated for ceremonial decoration. In general, these woven crafts are available for purchase at a low price with ranges from 10 to 25 baht with occasionally on discounts and some entered the life on shelves without buyer. This generated an urge inspiration to engage

in employing traditional handicrafts and design knowledge to sustain the design's context and increase the product value.

In addition, bamboo is a material acquaintance to the community of Bann Lamn's daily life, where the villagers and their ancestry have utilized in the traditional fishing culture. Therefore, other research problem is the way to select an appropriated material that is available in the local community with easy access to include to the art process, and importantly reflect back to the community benefit as a whole.

Woven products that Thais have enjoyed and used for generations exists in farming, equipment, hunting traps, vessels, food preparation utensils, basket, urn, fishing trap, or hen's loom. However, most problem occurs as bamboo is misused from multiple perspectives such as in high moisture absorption environment, with extensive outdoor used under extreme sunlight, and lastly sensitivity to mold and mildew deposits due to lack of sugar and starch in bamboo favorable for insect and moth colonization. Initial goal was to transform the bamboo to ferment with salt, soaking the material into salt bath for 2-4 months. Nonetheless, the period of fermented coding may depend on the wall thickness of the bamboo, which will indicate the particular type of quality that necessary to set fundamental standardize rule in caring and crafting work with such materials.

In recent years, many designers and cultural regulators in Thailand has begun to awaken and help the local heritage because every minute of the local heritage is fading away. To serve as a commercial center for the conservation of Thai knowledge and handicrafts throughout the world for the sustainable well-being of the community, for example, the Thai Government established an international arts and crafts center. (Public Organization Traditional craftsmanship) and the knowledge hidden within them are under threat of extinction. Preservation of culture and cultural heritage and folk arts

Therefore, the decoding of ancestry wisdom and common routine practices, to combination of procedure techniques, and suitable materials, would require to create a

contemporary craft design with sustainable products worthy of higher quality for future development. Since, handicraft variation in various regions are scattered with specific quality and market needs, the producer must develop to support the commercial growth and success for pertaining cultural preservation as well as responsibility for the environment.

### 1.3 Objectives

The intention of this research was to develop new art and design perception and value from tie and knotting with an appropriate material such as bamboo ligament. This research provided the method and process of used tie and knotting for creating creative decoration furniture. The objectives have committed to:

- 1.3.1 To investigate the original Knotting history and process including the related material for knotting such as bamboo, rope and paper.
- 1.3.2 To determine the Knotting techniques integrated with materials from Thai kite works, fishing nets, basketry handicrafts and furniture.
- 1.3.3 To construct the new design perception of creative decorations and design art from knotting techniques.

### 1.4 Definition of Terms

Tie, Tying - to fasten together two ends of a piece of string or other long, thin material, or to (cause to) hold together with a long, thin piece of string, material.

Knot - a join made by tying together the ends of a piece or pieces of string, rope, cloth.

Hitch - Rope or yarn Etc. tied in a knot Such as a knot or a jerk knot Is a knot that is easily tied and jerked out

Furniture - large movable equipment, such as tables and chairs, used to make a house, office, or other space suitable for living or working.

Handicraft - a particular skill of making decorative objects by hand.

## 1.5 The questions of the research

1.5.1 What are the factors that retain the knotting and tie local craft heritage and valuable in daily life and economic benefit?

1.5.2 Even rope, what local materials are suitable for knotting and tie to making interior decoration, furniture and home decoration?

1.5.3 What kind of art or design that would represent the knotting and tie local wisdom and creative economy value?

## 1.6 Research methodology

The use of Practice Led Research approach as the primary method conducted for this dissertation with mixed research objectives. As Candy mentioned in, Practice Led Research Practice-led Research is concerned with the nature of practice and leads to new knowledge with operational significance. The main focus of the research is to advance knowledge about practice or to advance knowledge within practice. In a doctoral thesis, the results of practice-led research may be fully described in text form without creating a creative outcome. Such research includes practise as an integral part of its method and often falls within the general area of action research. The doctoral theses that emerge from this type of practice related research are not the same as those that include artefacts and works as part of the (Candy, 2006a).

However, elements of practice-led research are not enough to contribute to all the design process. Qualitative research and quantitative method are used to verify and to encourage the analysis, which has the objective to fulfil.

Begin the research by qualitative research to directed using a case study methodology of knotting and tie history and background to bring a deep and robust understanding of the subject's complicated issue. This paper also reviews the case study as an observational inquiry that investigates a contemporary phenomenon within its real situation context. In defining the boundaries between knotting, tie, and various material, multiple sources of evidence are used. Scoping will be conducted to divide the research into comparative studies of different material types, such as bamboos, ropes, and different binding styles.

### 1.7 The Importance of the research

- 1.7.1 To provide a context of Thai craft and folk arts, wisdom of knots and tie.
- 1.7.2 To explain the importance of the arts aesthetic for creative craft and creative design.
- 1.7.3 To clarify the relationship between handicrafts to contemporary designs.
- 1.7.4 To demonstrate traditional handicrafts to contemporary designs.
- 1.7.5 To develop the technic of knots and ties style in creative design.
- 1.7.6 To promote handicrafts in the Thai local community.
- 1.7.7 To obtain knowledge and develop creative handicrafts to the world.



## 1.8 Scope of the research

1.8.1 Study the knots and bamboo material, rope, paper, cloth.

1.8.2 Study of tie in Thai kites, household appliances, agricultural tools, basketry, fishing rope and tools.



## Chapter 2

### LITERATURE SEARCH

This research employed the method of decoding a creative art process through cultural practices and local wisdom based on Thai' kite creation (Jula and Blowfish) along with fisherman rope tying techniques. Personal experience based on the research direction, originated from the relationship with life at sea and kite's play. Where at an early age, memory of living with the elderly (my grandfather) has help build many fond memory and appreciation for the arts. Observing my grandfather constructed a kite, the sitting and waiting, the concentration and hope has yielded into a simple happiness and warmth. As recalling that specific shared moment, the yearning of extracting such memory into current art skill and construction procedure toward explanation analysis and synthesis for which the understanding of creative development, were needed to take a concrete form. This chapter will mention the knotting techniques and selected materials such as bamboo, rope, paper, and fabric, which focused on each characteristic that regard to products, and related interior design. By extending the definition of material's nature, previous methods, and its detail as an investigating jump start for data search, for potential, for the relation, or differentiated materials to form a body of new design knowledge.

#### 2.1 Traditional handicraft

Handcraft is not just an object or product created to have only utilized function. Its best characteristic is actually visualized by the master artisan, specialist that earn the articulates rights from one generation of master to another. Therefore, Thai's handicraft pertains astonishing characteristic and revive numerous benefits for daily life.

Folk Arts and Indigenous handicrafts are a fundamental art cultural practices that's done without the known owner. It is a form of expression where the community

action represents a unique benefit on a global scale. Function may appear as the main focus as notion of handicraft not only considered as beautiful but also sustain the sense of creativity that reflect cultural wisdom representing suitable region climate replenished with philosophical solutions worthy of learning of a simplicity life process.

Prior to defining the Thai's handicraft, a concise terminology refinement is required. Arts may refer to object invented by human from creative thinking process, in which include imagination and inspiration defy through artist reflective response to the emotional factor. Literature arts based on Hanuman from Ramayana is an example in reflecting the demonstrational illustrations that resonance Thai cultural identity.

Seaman's way of life pertains an interesting factor to be considered. The notion of life by the seaside, closed to sill and mud clay, bamboo shoot stock absorbing the harsh wind and ocean wave, thus methods in tying various rope fastened with selective bamboo stem for fish trap and netting that brought food upon household. As human continues this daily routine, cultural knowledge occurs along with the nature cycle of climate change that generate memory, records, and apply the ways of adaptive survival to make a living. "As human changes the way to live, rely on nature that alter to living with 4 life Factors, man then created arts (Crafts, Handicrafts) as tools to make a living (Candy, 2006a). Seaman's life will pertain the relationship with rope tying, tool making, and ocean's life equipment by using various knots for such objects, for habitat construction, boat chain connector, fishing equipment, racks for drying fish, or preserving the cooked food, as well as woven talisman, medical case and spiritual beliefs until all 4-life factor is completed.

In addition, Wiboon mentioned that wicker technique is considered a local wisdom deemed for importance for living sustainment for people. In supportive way of life and moral value from the existing aesthetic, the articulate practices and the notion of indigenous connection that would bring the pride to the broader spectrum and capability to extend career for further achievement (Leesuwan, 2015).

### 2.1.1 Traditional Handicraft in local living context

Handicrafts exist since the beginning of mankind history. Thus, with today point of view, the first examples are objects to protect and to cover the body. As time progress, handicraft developed and followed the changes from the environment to eventually becomes traditional style and acknowledge as the arts created to reflect emotional intelligence from art and cultural characteristic as society to reach the unique identity distinguish from each province and township.

Handmade products that aimed on its beauty from art and design. Created for use to counter everyday life according to environment with care for each living area. Sample of local Thai's handicraft are silk, silverware, ceramics (Benjarong) rice paper, teak furniture, puppetry, or woven goods. All are unique in their own characteristic color, patterns, and craft process, which resonate the various aesthetic meaning of Thai craft. Beside this mentioned, Thai's handicraft possess a mirror reflection to help recognize Thai's way of living whereas each generation are being represented.

Craft means the art made through hands with attention for intricate detail, in material selection, and with extended practices on the personal time will most likely result in alternative knowledge from learning through doing that may increase the skill overtime. This justifies the quality of the aesthetic but may not reflect the actual connection to daily benefit or usage beyond the beauty on the shell. New generation of consumer then may not seek this particular type of art appreciation such as woven grass handbag, or woven basket.

Creative Craft means the articulate handicrafts with process and methodology on materials selection, on practice and training the skill, for which to generate knowledge base, professional skill that combined in the creative thinking suitable for current creative situation. Previous experiential skills but employ with new acquired skill, way to use new materials or applied industry skill, have reform its content with creative

imagination to extend the creative level when interpreted the originated story, context, or art and creative sites.

### 2.1.2 Traditional Handicraft in fishermen's village, Bann Lam District, Phetchaburi Province

BannLaem (บ้านแหลม) is a fishing village turned industry area located in Phetchaburi Province. Situated with houses near the seaside, retained the unorganized living planning, with squid drying rack spread in the area, chaotic noise around the harbor from boat engines, bamboo tether floating on the shore line, all have yielded a typical scenery witness as growing up around such living atmosphere.



*Figure 1 : Baan Laem Harbor*

Cultural identity and traditional upbringing in Bann Laem, with typical geographic area, this district located to the tip of hen's head in gulf of Thailand. Other areas comprised of wetland vegetation, estuary, and mud landmass extended 20-25

kilometers. As sand shifted toward large shells and small slope of mud sand hill, it moves and overtime becomes fine granulated sand. This characteristic helps create a mangrove forest as it naturally carved out a land to hold water until flooded, redirecting the wind and water current, and creating a canal and river, as well as numerous wild forests. Seasonally, the villagers take the advantages of such an abundance of resources in building the workforce and jobs with the everchanging climate condition such as ocean tether, salt mining, fishery industry, mangrove sources for firewood, and looking for dietary sources from the rise of the ocean tide. This is to support a living that generated materials into tools such as: bamboo based and knotting and rope tying that transforms into knowledge to help creating equipment in a form of seaman's essential tools: fish netting and wickerwork. Furthermore, to catch the marine life for food, a netting maze is mechanized to cater each oceanographic features thus additional tool is conceptualized to preserve the captured stocks in form of drying rack, basket, and expanded to habitat techniques such as roof and furniture piece. After creating important object for daily use, the knowledge carried over to creating toy-based objects, related to the idea of wind and gliding, traditional kite crafting that famous for countering the oceanic wind during a month of March and April with additional strong seaman wind repeated in November and December. For each directional wind, brought variation of marine life along with the sense of celebration using kite's play notion.



*Figure 2 Fishery in Bann Lam Village*

Bann Laem also identify with rich resources, included workforce in fishing industry as the forefront of the province's bay area. This generated market exchange with foreign commercial fishing country in the past, established as main economic trades with salt and dried seafood. Business with Malaysia in the old days, required sailboat skills in sails and maintenances to manage the unpredictable sea condition. As sailboat and commercial ship anchored, the setting of trades and exchange of goods took the main stage in the local daily life. As witness by several elderly (Aunt Noey and Aunt Kept Cheawsamutr), which recollected the memory of a four-year-old boy (the researcher) of having a special treat from the sail ship. The experience indicates that Bann Laem area has been a historical trading center, thus several sighting of helm post and ship deck, lathe factory, gearing pieces, deep ocean boat, large fishery industry all developed into seafood business as dried good for export. Thus, brought together the monetary incomes based solely from the traditional practices with such seaman lifestyle and generated wisdom from rope tying and its knotting techniques for fundamental work and local job incomes.

Existing workforce around the harbor has a certain connection to a seaman lifestyle. Since the villagers will utilize what resources available for them to create the best use of the living situation, as that notion of thoughts eventually influenced the product identity. From fishing, wickerwork, and harvesting workforce, salt container was constructed with bamboo, using simple knotting cork base to thicken and better sealed the container. In addition, the salinity level concern and moisture fluctuation for bamboo with tighten wicker locked can expand the life cycle of the container to 10-20 years. This also depend on the positioning of the container to which avoiding direct harsh wind and sunlight that the knowledge become a local wisdom gained through period of living in the region. Furthermore, the knowledge carried over to the building technique, allowing the transition of construction and favorable location selection based from anchoring method and material preparation on the bamboo to increase its potential for use in a climate and land condition building structure such as: houses, community structure, or warehouse for seafood industry.

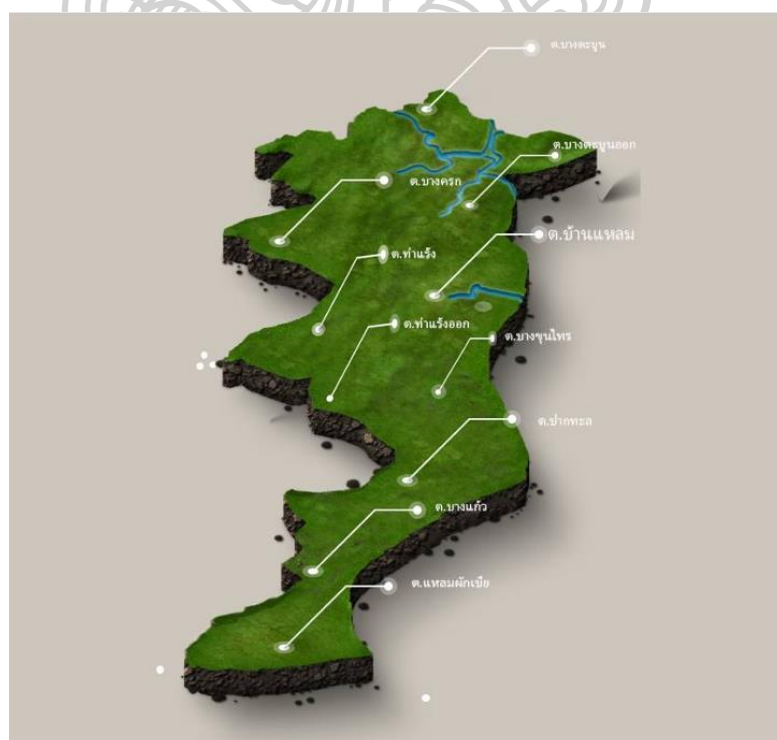


Figure 3 Bann Laem District Map



One of the childhood favorites was a “Kite” that the elderly (my grandfather) made for competition and contest, since he is a competitive kite maker from this district. In addition, with his knowledge in wind category and sense of reading seasonal wind direction, as such made the crafting of kite at Bann Laem a worthy quality—with tying and use of knot types unlike others.

The important inquiry about Phetburee is how to bring the arts that surrounded and influenced the life, tradition culture or contemporary toward a realization of regenerating the arts for people to continue that learning experiences in building career and sustaining incomes.

Traditional Handicraft at Bann Laem resonate variety of handicrafts that supported to improve the daily life, whereas related to food, jobs, or living supports. As basic as it appears, fishing industry, netting tying, or designing drying fish rack, have all represented the trait of handicraft, even if it’s just a process to dry out the fish. Any handmade processes then would be considered vital crafts, created by hands, making such objects of wearable textile, medicine container, and living houses. By grinding plant to make herb, the area is full of local wisdom, demonstrated through objects and knowledge exist through the making and refining processes. Thus, make this wisdom knowledge a core living support, but without recognizing such talents and skills that already retain within themselves.



*Figure 4 Basket weaving*

Handicraft work in Bann Laem fishing village may not have the variety of materials. However, the identity pertains from ways to conduct each material's skill adaptively to create variety of clever functional benefits. Essential living reflects from village' handicraft comprised of clothing, medication, habitation, and food, of which when focus on the living area, the art of tying and resembled wickerwork is utilized as readjusting the living vicinity from found local resources and use of tying skills to make quality living solution. Using basic knots variation, combining with variety of bamboo techniques such as pully, tether loam, drying rack, roof construction, and floating platform, which are the crafts that supported and practiced from all the individual member of the village. This connection extended to the neighboring village of Khao Yoi, located to the north on the hilltop, which skillful in wickerwork in supplement to Bann Laem with established skill in fishing platform.

The type of bamboo chosen by Bann Laem is known as Sri Sook ages 3 years and up. It is a typical handicraft material found throughout the fishing village but may pertain the special meaning difference from another village. The particular wisdom is the construction of bamboo platform, with low-cost and easy to gather the materials, making

the bamboo method in Bann Laem a participatory event for all member in the community. (As seen in Figure. 5).



*Figure 5. Bann Laem Village*

Kite as a human invention, designed for play, as a leisure activity that can benefit variety of community activity. It is becoming more popular in many regions with characteristic variation expressed the originated regional style. The kite bearer displayed the gliding and cutting through the skyline with technical skill, preferences to their own region and up bringing traditions. There is a certain cultural value worthy of preserving, dated back from Sukhothai, to Ayutthaya, and Rattankosin Era for more than 700 hundred years. (As seen from Figure.6).



Figure 6. Pentagonal Star Kite (Jula)

For all Thai's communities, kite is well recognized and played a role in growing up for the children, for which it carried a message of challenging the law of nature and representing style expression from various provinces. As time progress, kite has received an overhaul in form, materials, pattern, and color variation, thus remain a cultural mean of expression that reflect the creativity and imagination of the maker. In light of the idea variation, the form and pattern of general kite making are still basic and similar in many provinces or oversea. But despite, the sameness, the differences do reflect the city, the town, and the culture of the maker, emphasizing the continuation of creativeness for the next innovative piece.

Categorizing of kites are arranged from various regional form, with central region found pentagonal form, blowfish, represented as bird, as diamond shape; the northern region found pentagonal without tail; eastern region found diamond-shape and small pentagonal; northeastern region pentagonal with elongated tail; and southern region found bird-shape, angular fold, animals-shape, elongated structure, tubing form – but popular is the crest moon.

Stem bamboo *Bambusa blumeana* is the choice of material selected for kite making, which considered a sacred wood. Farmer often grow this type of bamboo around the home as fences or boundary divider. In cultivation season, bamboo stem is

used to strengthen the handle and positioned as a field rake due to its flexibility, stiffness, and spring-like textural property. The selected bamboo often pertains high quality, recognized for its sustaining level for high tensile force and light weight. When use for children' kite, more ripen version of the bamboo is chosen, and peeled into sheet for use in structural frame. But if the pentagonal kite is to be made, much older bamboo of 7 years or more will be selected. The chose has to be just right, too young then too flimsy, too old yielded problem to be too stiff. Also, a 3-4 years old bamboo is favorite for use in designing a winged-pentagonal, regular basis kite, or to relieve the blessing. It is known that the better the material the better the outcome quality. Today in the modern age, the Thais still uphold the special cultural belief, and often ask for blessing on the topic of their liking.

People's wisdom derives from gathering our surrounding resources, and make sense out of it, by categorizing into local invention for daily objects, means related to dietary plan, and toy. Kite has been considered as the household item that made from banana leaf at one point. The chosen leaf is usually large and found around the northeast region practices for food packages, the notion of wrapping objects by banana leaf can then be imitate into making the kite's surface. A "Leaf Kite" is prepared from sun dried leaf that brought to connect with the tail, tie up with rope and made ready for children to play and further the imagination. It is a simple way to make kite, from general found materials and items, with bamboo that naturally grown, and along with the wisdom and articulated skills, the kite has been a creation of excellent example to indigenous knowledge. Today, based on the bamboo quality and characteristics: strength, tensile property, or moisture absorption, kite making process can be easily prepared. As a closed investigation, the local wisdom has demonstrated many benefits to the knowledge that divided into the tying technology, the fastening feature, and material selections of both bamboo and paper or banana leaves.

A study of tying techniques for community handicraft can be divided from skills in creating household items and toy as follow:

- Kite Creation: Pentagonal, Blowfish shapes with tying technique and bamboo selection.
- Tying technique: from seaman fishing net
- Tying technique: from wickerwork in household and hunting tools
- Tying technique: from furniture, household tools: chair, bed, palanquin

An in-depth study on the arts of handicraft wisdom for the purpose to reveal the techniques for product design creation (interior decorative idea and creative process) is all the knowledge with compelling stories worth the collection. There are tales and ancestry description, of which talked about bamboo selection, tying technique, modification idea, strengthening the material, weight distribution, and creating natural material from local vegetation to extend the value of the community.

#### *2.1.2.1 Wisdom in Tying Techniques Bamboo Selection from Pentagonal kite process in Bann Laem Village*

The pentagonal and blowfish- shape kites in Bann Laem tend to pertain unique identity of shorten legs with spring-reaction to helps control the swift movement of the kite. Bann Laem's kite crafted with ability to glide-escaping the competitive kite using the proper seasonal wind.

Kite making techniques consist of bamboo selection, the tying skills, formula in calculated structure, proportionate features, which derived from technical and traditional hands process from the past and current generation of local wisdom. Borrowing the arts of tying from the seaman knots, notion of kite's play that rely on the cleverness of non-related skills and adapted into another creative craft process, resulted into more than the kite itself. But a knowledge needs recognition of various other arts and crafts successful creations from the local wisdoms, such as: rope spun to seal the boat's hole,

adapted with the animal hind skin adhesive to tighten the knots, or grinded rice or noodles mixed with warm water to make glue, have all served the tying techniques and extending its life cycle.

#### 1) Pentagonal Star Kite (Jula)



*Figure 7. Pentagonal Star Kite (Jula)*

Making pentagonal and blowfish-shape kites required a study of knotting, tying, and selective bamboo. Pentagonal Star Kite (Jula) is a well-known kite in the tradition of kite play. Its name originated from Kula to Jula, with 5 angular shapes, appeared like star that rises quickly and require a skillful controlling experience individual with also strong good build.

**Structuring and Decorative Art on Kite** must require the articulate hands skill, since the structure needs to sustain the correct proportion to catch the wind. An experience controller is also needed, where procedure is arranged into five sequences from preparation, sharpen, structuring frame, papering surface, tying, and breasting the frame, with the followings:

**Preparation Step:** In preparing the sharpened wood, two steps are wood preparation and wood shaping that comprise of wood selection for building the main frame, by cutting to a bit smaller than the intended size and start splitting into long piece to sharpen and use for the next step.

**Sharpening Step:** For wood prepared for the cut may come in various size and form to suit the kite making process. Kite maker mentioned that the cutting motion is done with framing thoughts and preparation in mind, creating a natural flow of the process, cut for long or short or main frame were thoughts that also help the transport, the creative process planned right in the beginning. One stock of bamboo may be used to create small kite up to 40-50 depending on the preparation and sharpening steps (personal communication February 2020). For certain each kite's maker holds various procedure and technique, some would soak the cut pieces in water (preventing the moth) and sundried until dried and ready for use according to the plan of the type or family of kites in process.

**Structuring Frame:** Framework is an essential part of kite making, as the prepared and sharpened bamboo is completed. From the data collected through observation and interview, framing began with tying the main length and the wingspan together. Where afterward, completed other features of the kite align with the main length crossed connection with the wingspan, readjustment required if needed. Important notes for tying the kite structure were to always balance each tie that considered weight distribution with hooked knot on one piece then cross finished with the hooked knot with the other piece.

**Papering Surface:** After the crossed knot is completed, the paper seal or surface wrap is a process to help accentuate the identity of the kite. Paper with thin but strong quality accompanying with household glue closed off the edges of the frame. Noted that paper placement, alignment, and proper stretch surface is a process done with patience and skill, it is time consuming and each step must follow accordingly. Completing the kite surface with sealed paper on the crossed connection junctions.



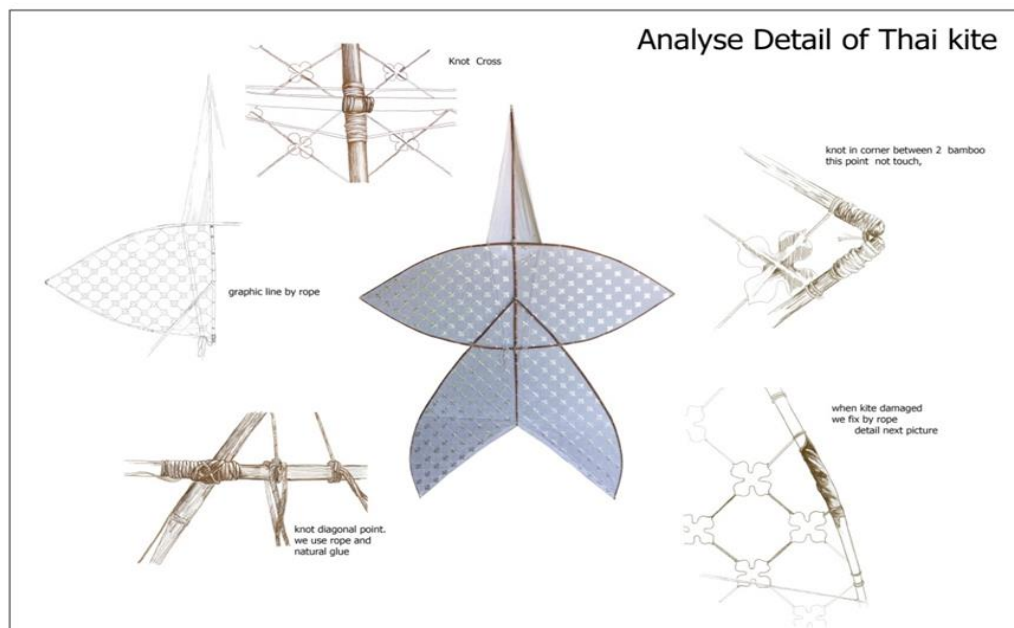


Figure 8 Detail of Thai's Pentagonal Star-Shape Kite (Jula)

In the kite making process, the important part is to tie and to choose the proper material. After the framing is completed, the more detail construction is required to fully consider the kite to be the proper kite, of which relying on knots, delicate tying techniques, and the mixture of selected materials as follow:

1. Knot on Breast Alignment
2. Piece extension
3. Tying the expansion portion
4. Tying the Waistline
5. Papering design

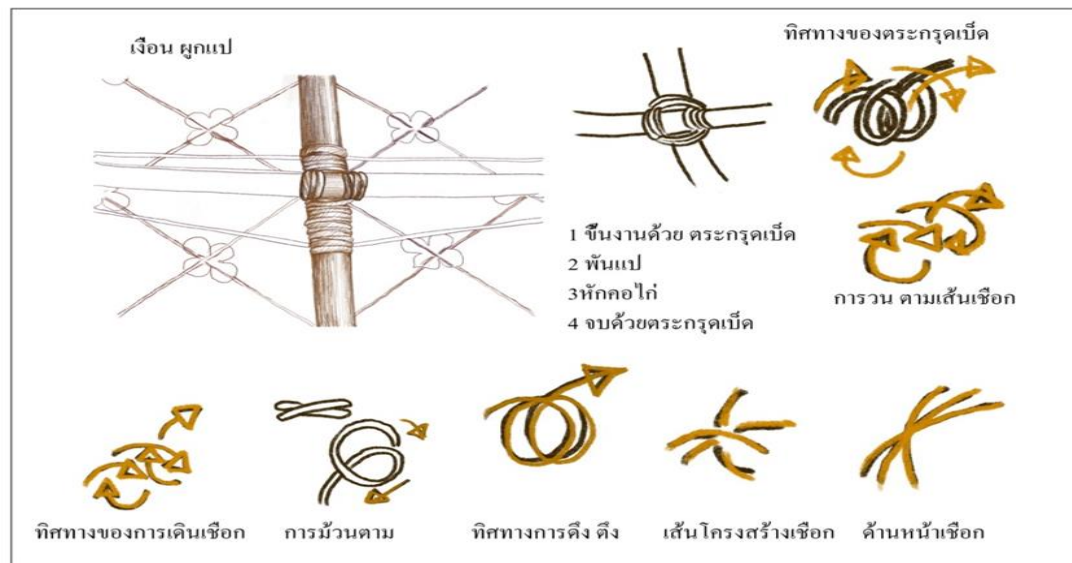


Figure 9 Detail in Tying Network Knot on the Alignment Point

**Breast Alignment** is a tying technique considered crucial center pivot position known as **network tie** or **crossed tie**, used for tying the main structure to increase strength and critical structural mean as the rest of the points based their position to create a harmonious flexible structure to the kite. Beginning with a hooked knot that wrap and tie around the pivot position and then closed off with crossed knot to give the frame a firm structural form. The type of hemp rope, from naturally grown hemp found locally, also use as rope mixed with wooden sap to plug and seal any hole on the fishing boat.

In the process of creating Pentagonal Star-Shape kite as the village elderly has explained, hemp rope is selected to tie with mixture of animal hind adhesive. This choice is applied for ropes used for tying kite frame in the region because as the climate is dried or too moist, the property of rope with hind glue can contract and expand according to the climate changes. As each year of kite's play, there's a loosening and untied the rope on the kite to prevent over-stretch or unnecessary marking on the bamboo frame. Thus, retied again during the new kite 'season to maintain the original intention of the frame and its design.

Presently, there are methods to improve the hemp rope by combining with synthetic plastic. However, the mixed rope is known in the market as mixture 80/20 that is proportion mixed between rope and plastic. In the tying process, the direction of the ties is crucial and an art in itself. The hidden technicality ties are the key to maintain the idea of knotting and tying technique in the community, plus it reinforces the structure and extend its use for many other creative and functional solution.

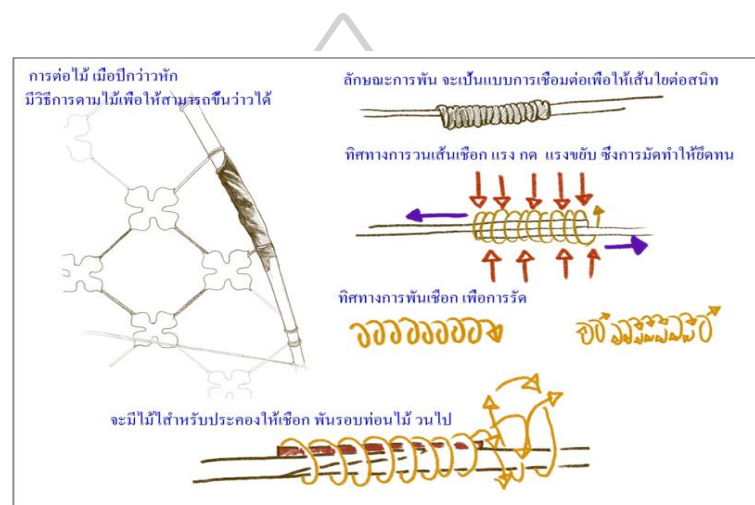


Figure 10 Detail of Connector/Expansion

Tying the expansion portion (Frog Legs), is placing two pieces of wooden part together and tie to connect with the breast alignment position, to increase strength to the overall structure. Therefore, utilized this technique to improve and adjust the shape and curve of the kite. When pulling and tying the rope at such position, the articulation in readjusting the frame can be carried out to help maintain the best positioning of the kite's frame.

As the pivot position can be easier access and readjust around the expansion area, the controlled curve and framing proportion can also be easily retuned for any particular purposes, as pulling motion or lessen the tension to reframe the overall look, It also helps with the lining of the bamboo at each curve, to reshape for the purpose of

absorbing air pressure on the surface to help with the incline and ability to climb at a faster rate.

Extending the wooden pieces for use in kite competition have benefited in accidental occasion when the kite fell and broken in parts. The skill in expansion portion of curve can help cast and braced two pieces back into one helping the frame into the correct position. By sharpened the new piece until thin and welt them into place with hooked knot. Additional fixed can reapply to reinforce the spot with adhesive, which will strengthen the frame and added the realignment to the fiber, preventing the interruption to the important curve of the kite structure.

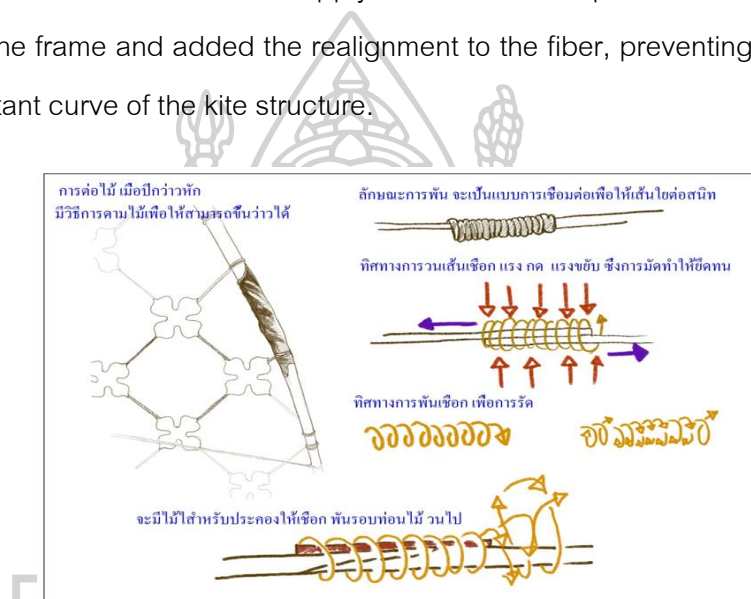


Figure 11 Detail of tie expansion with hooked knot

Folding the kite 'wings' is an adaptive skill, a basic tying technique to withstand the wind force and sudden shift of the paper fiber and rope pulled. Tying with hooked knot to construct the wings and ended the knots 2 cm before reaching the tip of the wings by another hooked knot. Split the rope into two strings then leading each ends of the rope to its position to fasten into the main stem. Repeating the tying helps to lock the rope and connected surface into place. Also, when applying animal-hind glue onto the rope to help prevent split end, that give more strength to the rope plus it makes easier to tension to the overall shape. When meeting at the crossed section, the wooden pieces overlapped to tie more crossed knot to even solidify the spot, by rounding your fold about 3 times and bring to locked tie with hooked knot to reinforce the connection of the

two pieces in process. Afterward, fold to the top again to keep the wing and breast align as closest together as possible, leaving no gap between the two features and ended with hooked knot tie. About three occasions as experimenting this process from the elderly (grandfather), the type of hemp rope is becoming a rare process material, even with its quality of sealant for traditional seaman. Where today is more based on synthetic rope with high quality from mixture of natural fiber, this rope finally become the choice of material for today's kite creation.



*Figure 12 Detail of Fine Tying Technique*

Fine tying of pentagonal star- shape kite is a process to which the finer string is tie to readjust and reshape the kite's form with the hooked knot. When rope is stretch, a gap of 7.5 centimeters, which considered to be the proportion to allow paper to fully stretch, so when the rope is pulled the use of glue will enhance and close off the space. When completed, there will be some rope ends, the process to clean this excess rope is

to cut a piece of patterned paper and glue on top of it. Whereas, the kite now has a stronger surface area because of the patterned paper patches as well. The art of fine tying is crucial where it can help fine tuning to strengthen each portion of the surface.



*Figure 13 Diagonal Rope Tying*

**Diagonal Knot** has a special characteristic when applied with bamboo when the stock is crossed together at a 45-degree angle. This connection is designed to help strengthen the tie, which will not cross at a right angle. The tying technique adapts from basic hooked knots used with hemp rope. It involves repeating the fold of about 5 times, then going diagonally and folding 3 times, and finally tightening with a lock knot on the other side. It is a common practice to coat some adhesive for this type of knot tie. Diagonal Tying is also unique because each spot that uses this type of tying detail prominently gives

attention to the area of the detail, the cross and diagonal contrast of the rope now become the strategy point, recognized with design and decoration, but all to help the movement and wind forces placed upon the kite.

## 2) Blowfish Kite



*Figure 14 Blowfish Kite*

Blowfish kite is small in size, in competition will persist around 50-60 centimeter. The main frame shape like cross and tighten into a squared-like form. This kite is considered to have unique identity, based on the central region and also viewed as a nation icon along with the pentagonal star-shape kite. It also holds a diamond-shape form similar to squared kite, but with stronger bamboo material on the wings frame. Therefore, it has a long tail to help centered and perpetuate the flight and also

known to equip weapon feature called “Neaug” (Sai like shape), emphasized swift movement when competing. As we encountered pentagonal star-shape kite, we would also find the blowfish around the area. (Youth Encyclopedia/ vol. 38/ no.4: Kites/ Type of Kite).

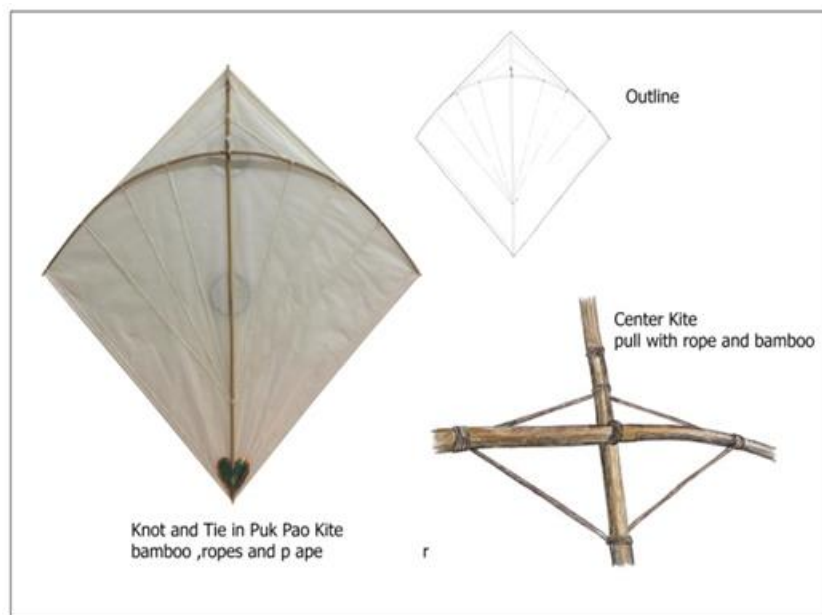
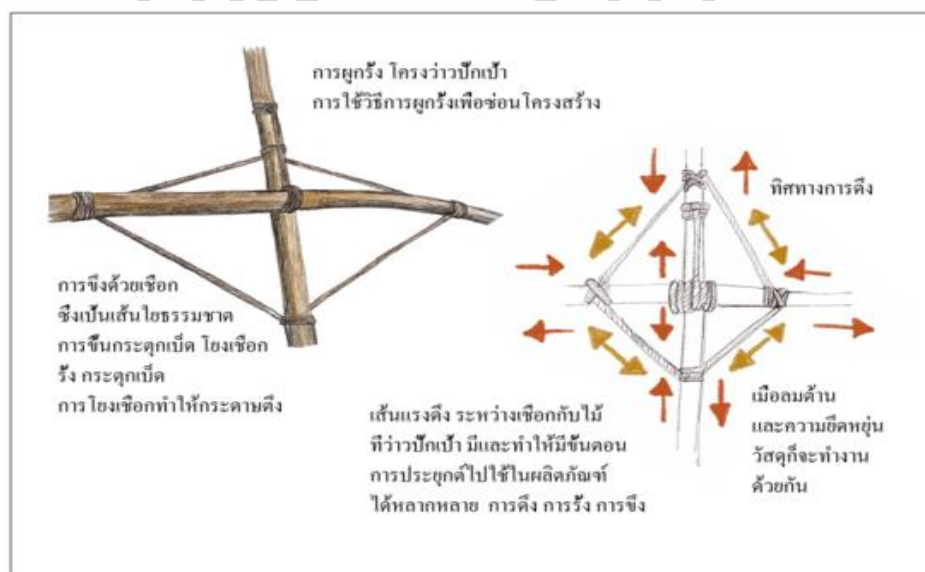


Figure 15 Blowfish Kite features





*Figure 16 Tying techniques: Blowfish Kite with Hooked Knot*

### Tying Blowfish Kite with Hooked Knot Tie

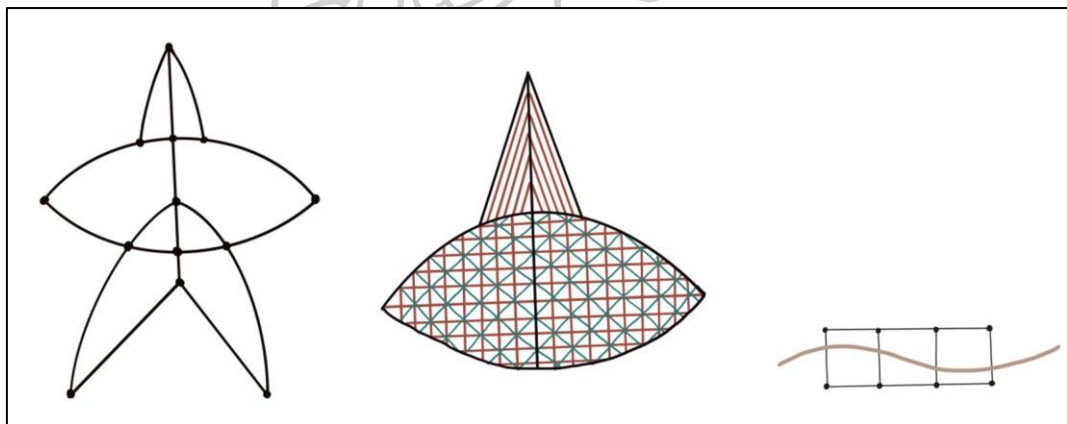
Way of tying Blowfish kite would not tie directly where the frame stem crossed at 90-degree angle, but tie with the hooked knot as an opened loop (female knot) and twist back and inserted into the loop to tighten the knot. By tighten the loop around the crossed area and stretch to the four ends on the wing-frame to helps maintain the balance when in lateral motion. This type of tying technique places a good deal of flexibility to the bamboo frame and offer a steady incline flight when pulled, creating a skilled craft best applied to escape and swift glide from the competitor.

### 3) Summarization of Pentagonal Star-Shape and Blowfish Kite



*Figure 17. Pentagonal Star-Shape and Blowfish Kite*

Pentagonal Star-Shape and Blowfish are Thai's identity kite have single-string structure that assist the controlled of the flight direction using technical selection of the bamboo and tying skill. Having the crafts of rope tying and knots variation, kites become product of articulation and collective preferences that can enhance with decorative features. As the use of bamboo, the sharpening, the tying, and the rope color dyed, which have brought a new dimension to structure and contemporary identity of the craft object. Nonetheless, knowledge base in kite making would need to express both technicality and cultural content for the information to achieve the level of acceptable recognition. If the art of rope-tying and structural bamboo framing can extend its value to other area of crafts and handicraft: fishing industry netting, wickerwork, as well as furniture details. This section will further explain related and possible handicrafts that can be applied for the creative process.



*Figure 18 Structure of Pentagonal Star-Shape and Framing Detail*

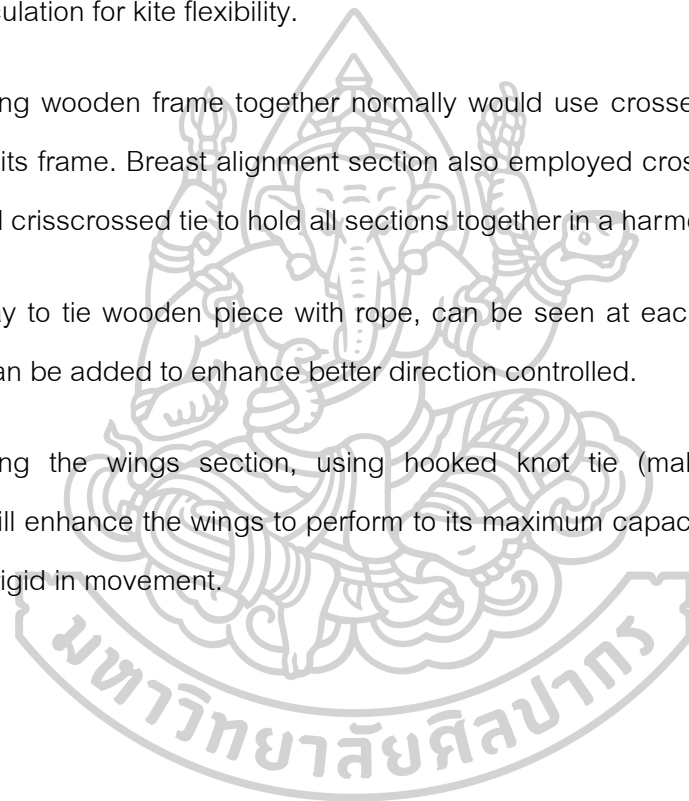
Balanced framing of Pentagonal Star-Shape has five strings and five structural points. Accordingly, characteristic of blowfish kite is mainly for “Battle”, with skills in creating imagination and planning on the structural design that also personify story and various meanings. Most of the design content expressed through the tying techniques, which demonstrate by tying connection that formed patterns related to the technical

position of the tying string of about 3 inches blocks to help control the kite frame for better movement. On the pentagonal star-shape kite, choice of paper were used to create pattern, where each section of the kite is decorated and also enhance the structure by the using sugar to help bend the accentuated curves. This quality pertains the kite to access better chance of catching the wind during flight, resonate the extraordinary form in flight that appeared in the skyline unlike any kite anyone have witness before. Eventually, this idea is transfer to construction form of x and y axis with precise calculation for kite flexibility.

Tying wooden frame together normally would use crossed knots as the main fastener for its frame. Breast alignment section also employed crossed knots where the middle used crisscrossed tie to hold all sections together in a harmonious way.

Way to tie wooden piece with rope, can be seen at each of the section tips, where tail can be added to enhance better direction controlled.

Tying the wings section, using hooked knot tie (male tying) where this character will enhance the wings to perform to its maximum capacity of how bamboo is flexible not rigid in movement.



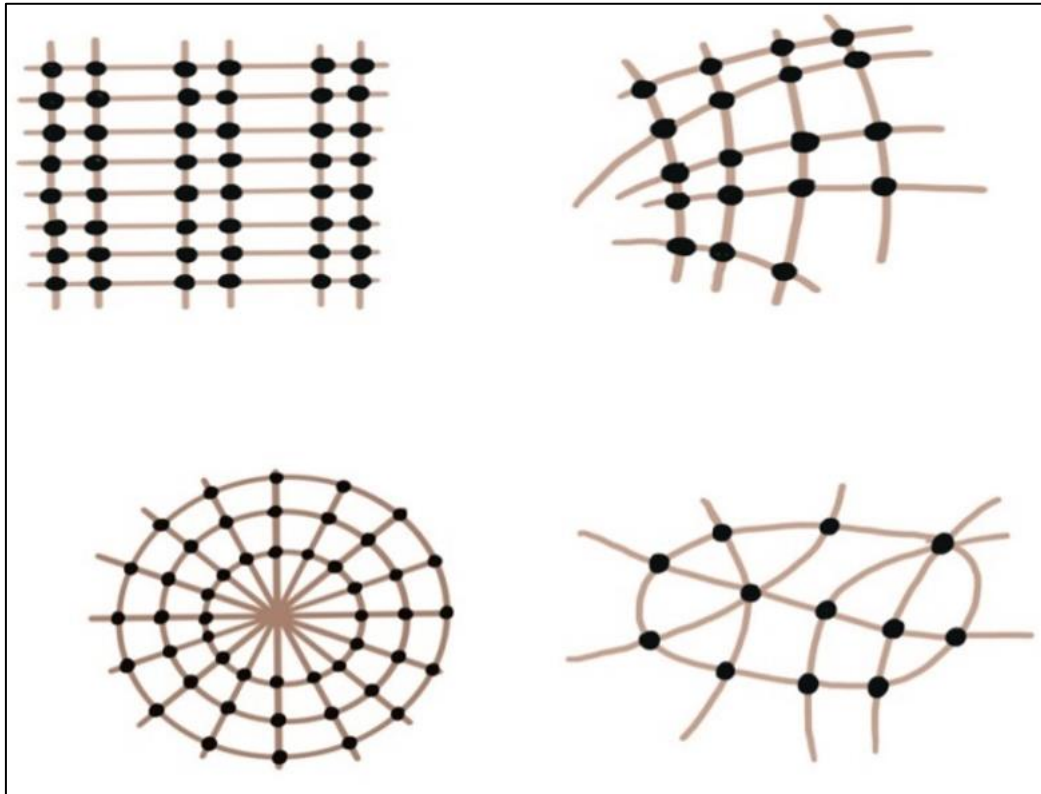


Figure 19 Lines and Tying Techniques

Materials gathers, where linework and point position pertain the indication for the abstract crafts, thus propel the rhythm of structure from combining the essential lines and dots. (personal communication August 2020). This can create a systematic understanding of lines and dots order, with special representation of the new take on the idea, using the crafts concept from local knowledge, as kite structure is translated by means of arts and calculation (combination between geometric form: triangle, square, ellipse). Line's variation indicates position to each ties and connections to create strength to the form (frame) in a manner of crafts expression (Kite's play).

#### 2.1.2.2 Bann Laem' Wickerwork Wisdom

Wickerwork exists with the fishing industry in Bann Laem has quality based on rope tying and crafts through bamboo knots techniques. By using tools from handicraft

skills such as netting, tether for deep sea fishing, the use of bamboo and hemp rope tying's capability expand the tool's life. Equipped with flexibility and suitable for regional climate, this tool and equipment reflect onto various form of daily items and household products as basket, cages, drying rack, screen loam, all related to the craft of wickerwork' tying and knot techniques.

Characteristic of life as a seaman, working for the fishing industry, initiate idea of utilizing local natural resources to raise the level of yielding benefits to the living standard. The outcomes from the main source of salary based on the nature of working with the ocean at Bann Laem persist of skill extraction that observe and translate onto creating craft for career. Sea salt farming and the tools for the process are crafts from bamboo wickerwork using basic wrench knot tying. As expected, the wisdom knowledge of such material can expand the life of the wickerwork product up to 10-20 years. This also depend on the position of the tool that avoid the downwind or prolong strong sunlight. Furthermore, the understanding has brought over to the housing knowledge, knowing where and how to place the wooden pillar into the ground, or wooden tied with variation of knots to hold the proper benefits to the structure integrity.

Wickerwork and woven goods are Thai's daily object use since the past. Aside from serving as a utensil, the woven technique created variety of tool and equipment for daily use, such as wicker-basket for fishing, prawn harvesting, in form of local name as saei, sumn, saneang, or yijoo. Clothing article as wicker hat to give protection from the strong sun and heavy rain; or woven furniture features as seat cushion, wicker carpet; or dietary wicker goods such as packages and loam.

Resources or objects made from wickerwork in Thailand has many variations and type of usage. In the northern region often crafted bamboo for daily use objects. But the south uses the technique with local plants and produced unique basket type. The central and the northeast are mainly use bamboo as wickerwork pieces.

The wickerwork and woven process in Thailand have followed this requirements practice: “Work” as act of splitting or cutting the bamboo, rattan, or other natural materials apart into thin strips. “Wick” as act of bending or folding material to tie together. “Woven” as arranging the strips to cross, to place on top, or to integrate or put together to create pattern as intended. These handicrafts processes are fundamental elements of wickerwork. (Linguistic Encyclopedia, 2011).

### 1) Basket (Kraboung)

Basket has a tight woven pattern. Rounded shape of a considerable height with oval opening and deep body of a squared bottom footing. “A common object to store belongings and vegetation seeds, woven with bamboo and covered strips, generally rounded or oval shape with bottom based in rectangular or square, reenforced corners with rattan and overlapping of material, equipped with handle loopholes to insert carrying stock, can be use in pair when carried on shoulders.”

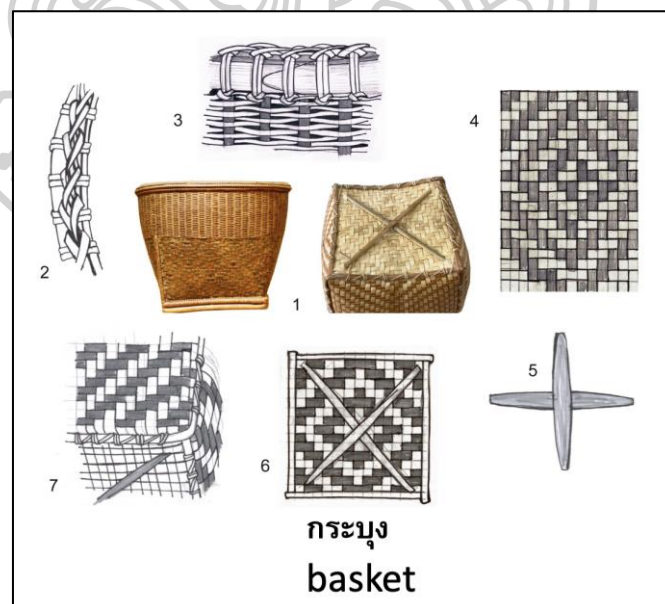


Figure 20: Basket (Kraboung) and details

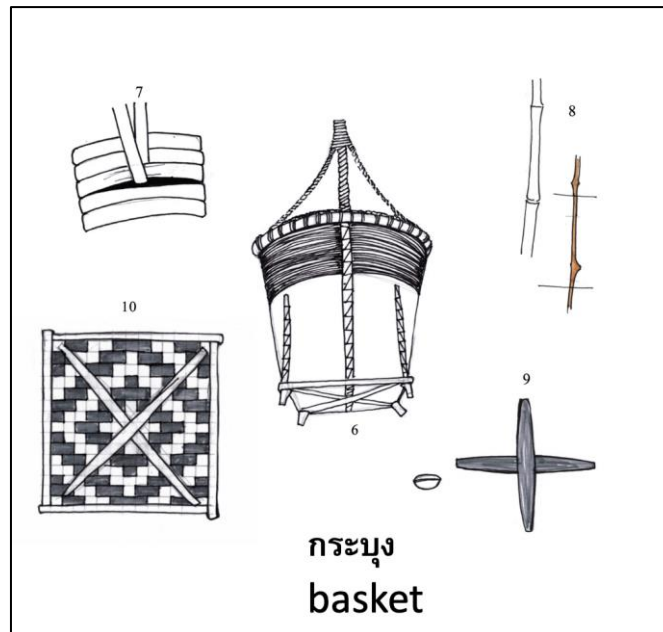


Figure 21 Basket (Kraboung) Courtesy of Jintra Puangkun, Boorai District, Trad Province

Basket are popular among general public. It can be carried in pair or on the back. Some regions may use it for measuring device, which known for basket crafts to hold 15 -20 liters. It comes in various shape and size and with articulated woven skill according to its origin. In the northern region, it is called “Pengde”, “Pied”, or “Boung”

1. Basket has shape and volume, specifically at the bottom finished with double stitches weave.
2. Reinforce edges with crossed fold
3. Storage opening from top with double loops and hooked knots, but used overlapped woven pattern into various lateral woven pattern or motifs.
4. Woven pattern on local motifs.
5. Basket's bottom woven stocks/patched patterns

6. Bottom woven techniques with bamboo supportive stock
7. All basket's edges need strengthen finishing woven features with hooked knot supply by added 2 rounds with rattan to tight pull, use increment of no more than 1 inch for increasing support.

## 2) Basket

Basket are woven into round shape, for storing belongings, made from rattan, bamboo, or plastics. Some pertain various shape equipped with handle features, oval opening, for each basket crafted for reasons and various functions. In terms of user, basket is important to recognize of social status, to reflect the artisan, and the hidden style of each weaver.

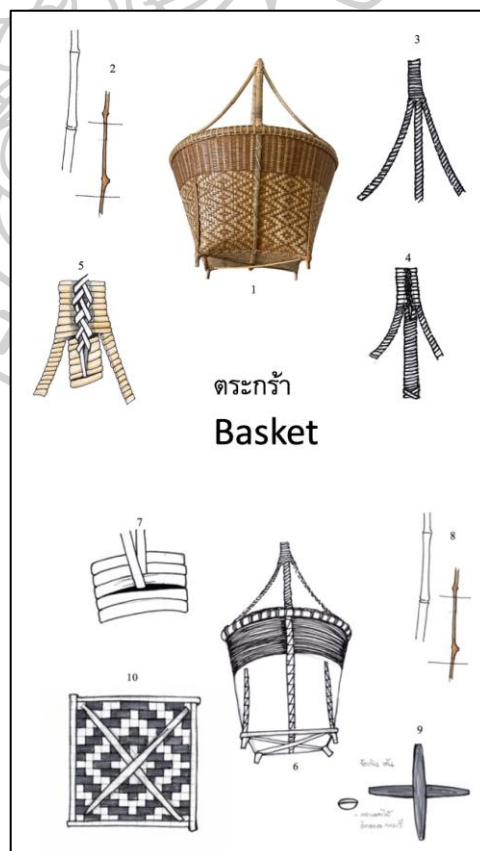
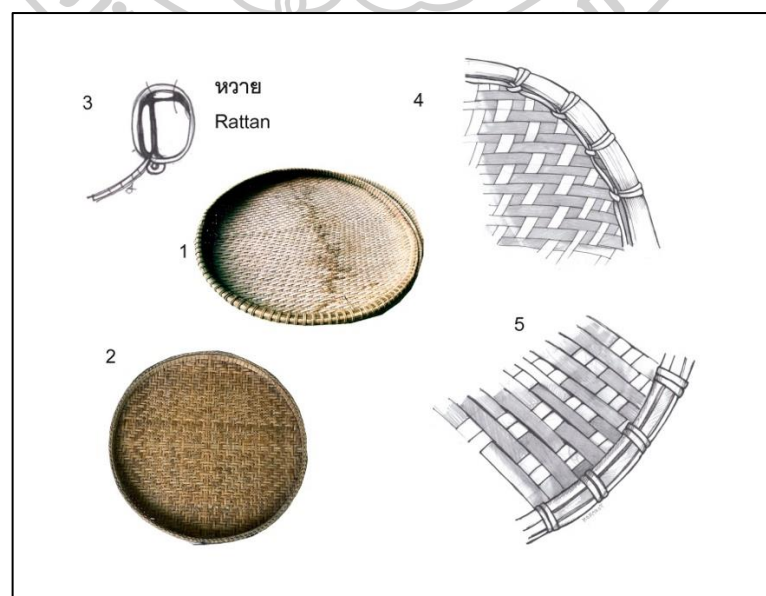




Figure 22 Basket with handles: Courtesy of Jintra Puangkun, Boorai District, Trad Province.

1. Basket shape woven with waterflow pattern
2. Basket legs used local bamboo source, found around Boorai District, Trad Province, to which use the bamboo node for leg pieces to strengthen the structure of a basket.
3. Reinforce edges with crossed fold, handle woven, rattan woven extension.
4. Basket legs
5. Bammbboo sharpened strips to proper size
6. Basket's bottom woven patterns/ patches for weight support for more than 5 kg.

3) Rattan Tray (Kradoung)



*Figure 23. Rattan tray (Kradoueng FradKao) Tumrong Subdistrict, Bann Lard District, Phetburee Province*

Woven vessel, flat with rounded edges, crafted with tight-woven technique, made for separate rice stem or for sun dried food. Larger size called “ Kradoueng Hmong”.

Tray is an equipment commonly used by “LaVa” community to filter rice grain or vegetation seeds. In addition, it served as a working platform when making dessert, which made out of bamboo woven from the center to reach all edges of the tray with a folded weave reinforcing the shape together. Mostly coated by smoke (practices by LaVa community) to lessen the chance of moth and keeping the tray dry and tight with little gap and moisture repel. Tray has the following beneficial features to handicraft:

1. Clear plan view of the goods
2. The closed tight woven surface, with the hooked and loop knots for cross-tie patterns.
3. Double stitch woven pattern, made with fine bamboo strip woven for to the edge, and strengthen the tray frame with woven rattan.
4. Bottom of the tray fasten by loop knots.

#### 4) Mesh lid (FaChee)

Woven tools shaped like half a sphere or dome, use for covering cooked food or dessert, or any meal vessels from insects. In general, a tight delicate weave to prevent the insects from the food and the goods under the lid. Aside from woven with bamboo and rattan, the use of palm or coconut leaf also found to exist to the craft

'practice. Today the most crafted mesh lid remains a woven bamboo and rattan (Leesuwan, 2015).

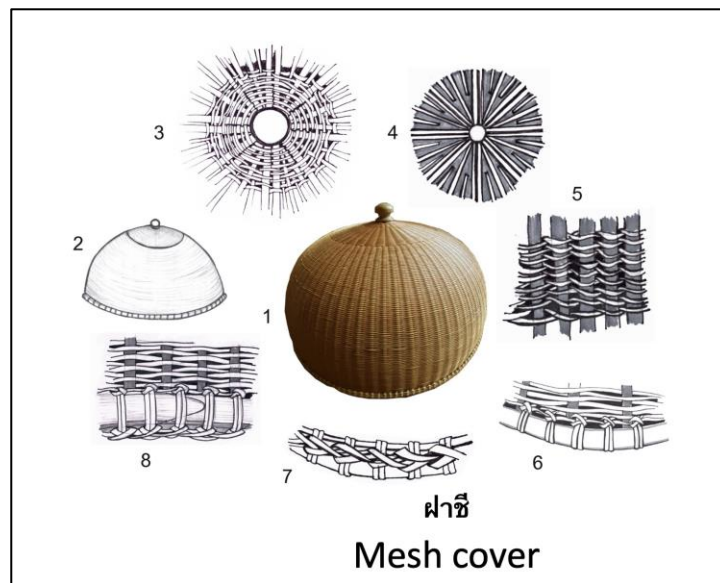


Figure 24. Mesh lid, courtesy by Jintra Puangkun, Boorai District, Trad Province, 2019

5. Mesh lid woven with local leaf *Donax grandis*, give soft texture.
6. Shape of mesh lid, a half sphere, tight woven toward the top
7. Details of the lid top, with lateral strips toward four sides of the lid, woven to strengthen the vertical strip where the parallel strip needs support to hold the proper sphere.
8. Vertical strip made for soft textured bamboo, which found around the vicinity of Boorai district, closed to “benjapun” forest.
9. Twisted woven pattern, to hold the shape in place.
10. 6 Tying work with hooked and loop knots

11. Criss-Cross Woven Pattern of the mesh lid.

12. Rattan to close off the edges, need both ends of the tie: top and bottom, since this portion of the structure will naturally tighten the form. The joint area made from *Donax grandis* fiber to create a better woven object.

### 5) Plate (Gabalb)

Plate is a vessel made from banana leaf or softwood strips. Shape as plate, that best for placing personal affects of hill tribes. Rounded top and double woven layers at the bottom.

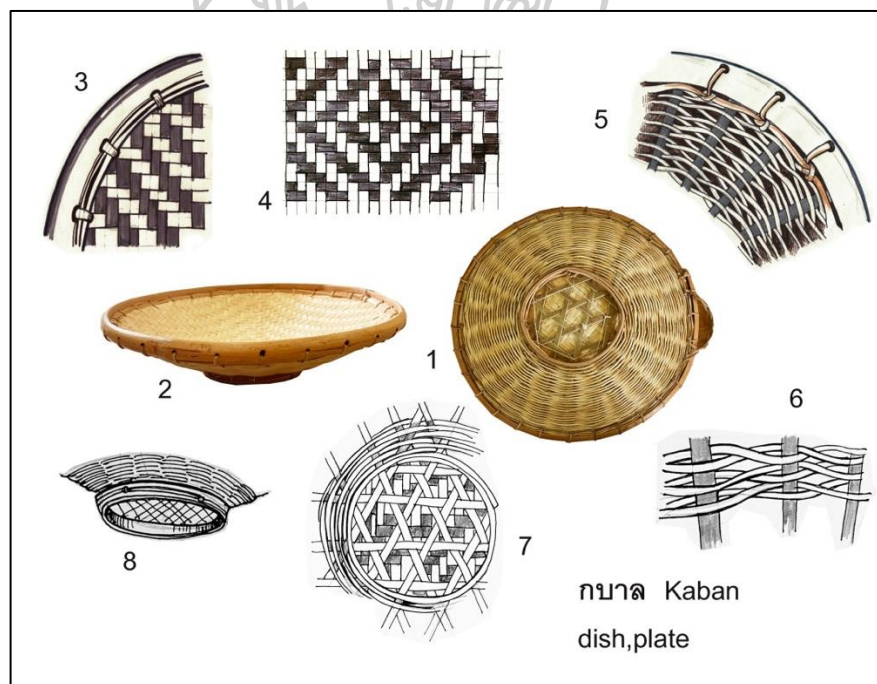


Figure 25 Plate (Gabalb) Pakayor MaeFah Lueang, Chaingrai Province.

On top, the plate is comprised of waterflow woven pattern, where the bottom used the slice skin of bamboo woven 1:1 for better structure integrity.

13. Bottom of the woven plate

14. Profile of the plate, obtain a rice bowl form

15. Woven pattern finished with rattan twisted knot to weave with aligned structure.

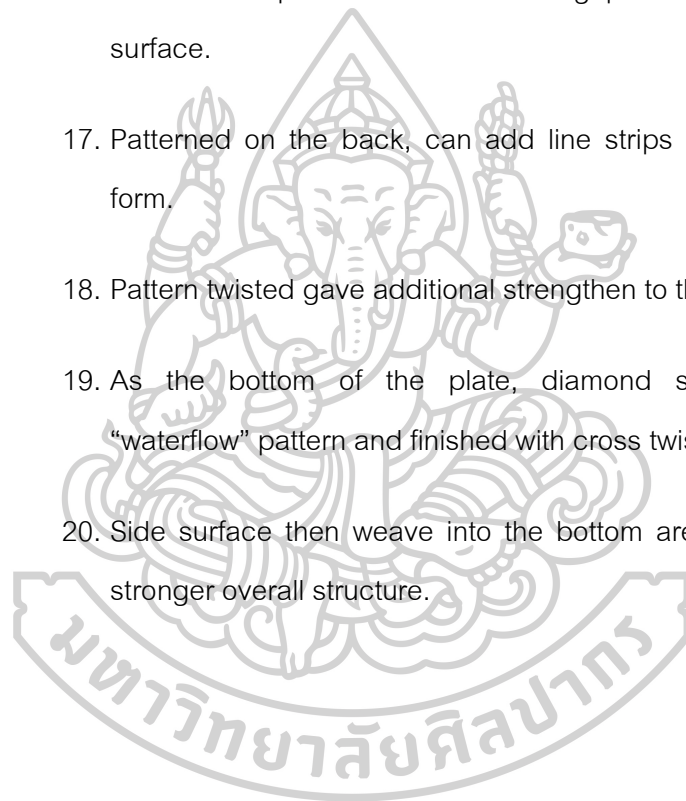
16. The plate surface is firm and soft suitable for resting sticky rice as the weaved pattern created small gap and yielded a non-stick surface.

17. Patterned on the back, can add line strips weave to set a rigid form.

18. Pattern twisted gave additional strengthen to the overall form

19. As the bottom of the plate, diamond shape woven within "waterflow" pattern and finished with cross twisted knot.

20. Side surface then weave into the bottom area, given dense and stronger overall structure.



## 6) Summarization of Wickerwork Woven Technique

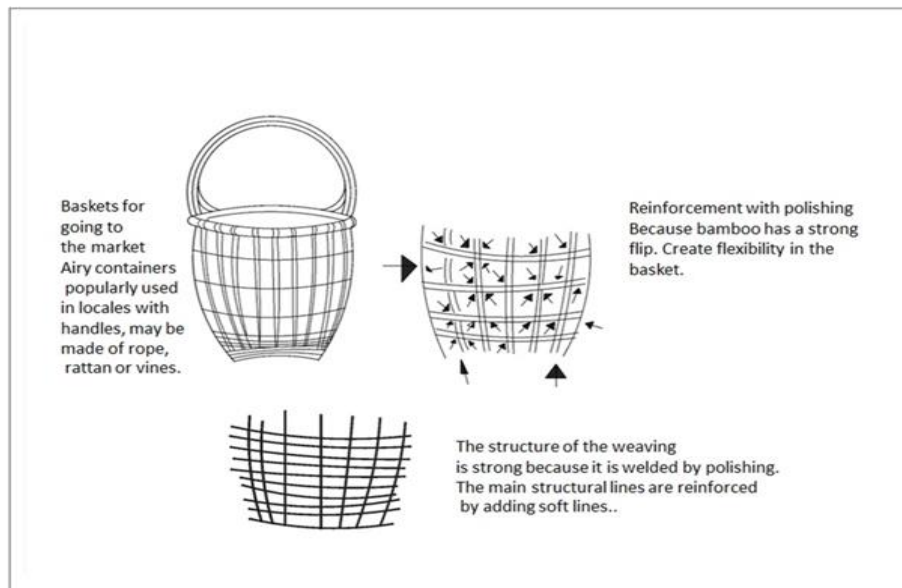


Figure 26 Detail of the wickerwork, shaping, setting structure of the basket to sustain strength.

Regular market shopping basket, a loose meshed vessel with handles made from rattan rope, vine string, or bamboo, crafted into a bamboo basket, which are popular among the community. The art of sharpened bamboo strip to flat shape, weaving mentality to keep consistent on the notion of lift and slip of 1:1, gap increment, crossed, and knitted, are all technical features that required practice. “We can admit to the ratio of 50% surface and 50% body of a basket,” mentioned by the elderly. Current techniques can manage the validity of the structure, to anticipate the stress of bamboo, and control the form to appear lean and suited for the function. Any vessel for food or dietary, then a readjusting of gap increment is required, thus make the object firm. The reason for constructing with mainly vertical and horizontal strips was not only to make the form structurally sound, but also represent the unity and networking- reflecting the community supportive nature where the crafts were made. Woven details can represent the nature of its maker, small delicate gap between pattern, the alignment of the strips

all inform the skill and care for the piece. Thus, create a crafted objects that appeared similar but each one may have fiber or pattern details and stories of its own. Subsequently, current craft process may not acquire the use of bamboo adaptability, which result in basket made just for daily market use, holding normal load of 3-5 kilograms to maximum about 10 kilograms. This reflects a bit of the current view on craft, where simple structure can withstand the weight but its best feature (vertical and horizontal woven structure) can help further extend to today benefits in crafts not only in structure and woven technique, but with other creative handicrafts and perhaps for creative process on new production of shape, color, or pattern– all with preference from traditional mentality.

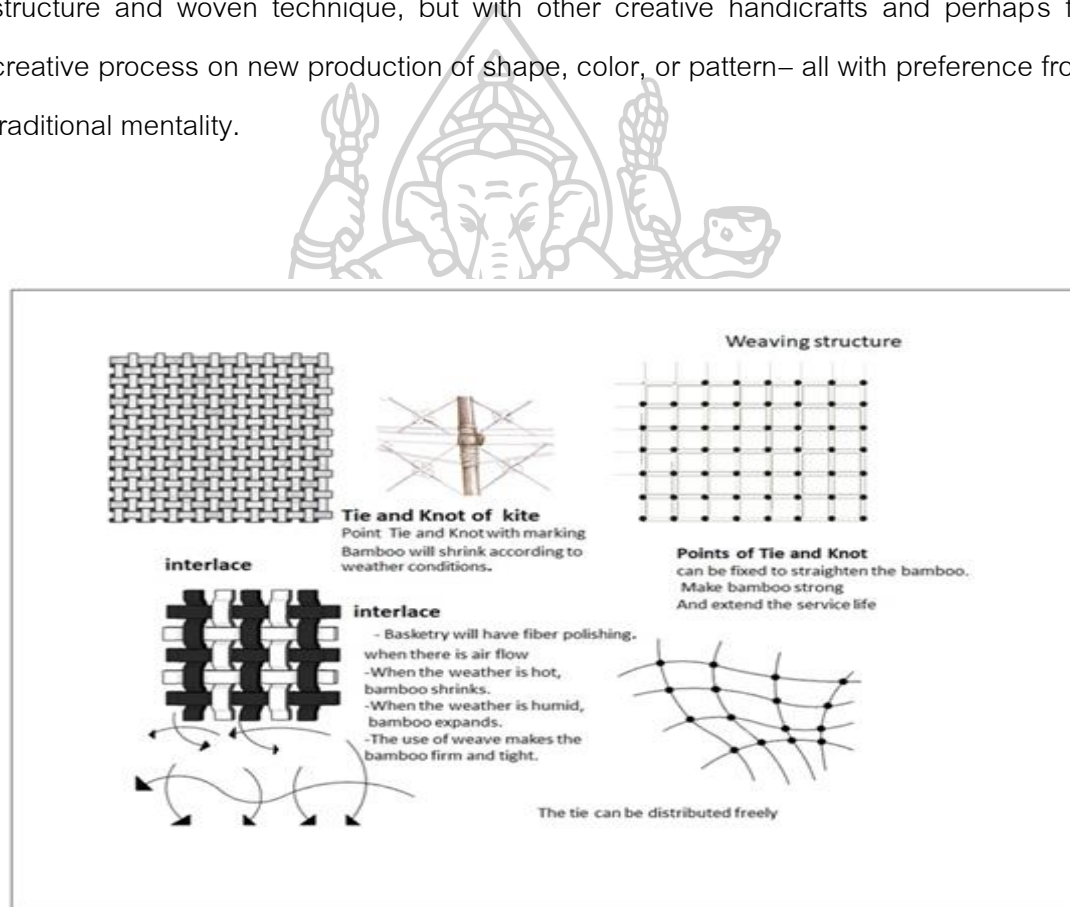


Figure 27 Tie and Knot

As the study of woven and wickerwork techniques is the understanding of structural format using tying, knot, weaving skills, and refining edges of crafted objects, each feature of the woven process are as well a form of benefit craft knowledge. Tying for example has a crucial knowledge point that need a basic knot, to protect the

shrinkage of bamboo's fiber. By tying rattan around the bamboo for structural joint hold, the process helps to maintain the flexible and tensile condition of the bamboo fiber. Thus, revealed the arts of wickerwork to have a delicate and articulate procedure to only through the actual practice and creating the craft with care of details, such as gap increment and shape alignment can the crafts become a complete art cycle. Pattern weaved as another example, comprise to increase the fiber and woven strip functional quality, even when under low air circulation- the fiber holds well in pattern form, preventing the loose or disform to the overall shape.

#### *2.1.2.3 Woven wisdom from fishing industry tool and equipment.*

Fishing industry catching net made from Bann Laem is well known for its quality. Where 80% of the occupants are living by the sea, having to use net, floating seine, pulling seine, tether, fishing equipment that required various style of basic knots. This knowledge of fisherman and seine weaving are supportive of each other duty and skill, which made the work a pleasant benefit for both parties. Crafting technique of the net or seine are varied in style and difficulty, from 30 meters for fresh water, or as long as 40-50 kilometer for open sea fishing. These skills brought the wisdom into a transition of crafting household objects and other related means of the seaman lifestyle.

Bann Laem villager also conduct occasional deep-sea fishing around the globe. Boat and ship artisan equipped with skills and knowledge on selecting wood for crafting or fixing the vessel, but most focus is in the craft of rope on fishing net and seine that emphasize the importance of knotting techniques and eventually to creative design process.



## 1) Horizontal Cylinder Trap

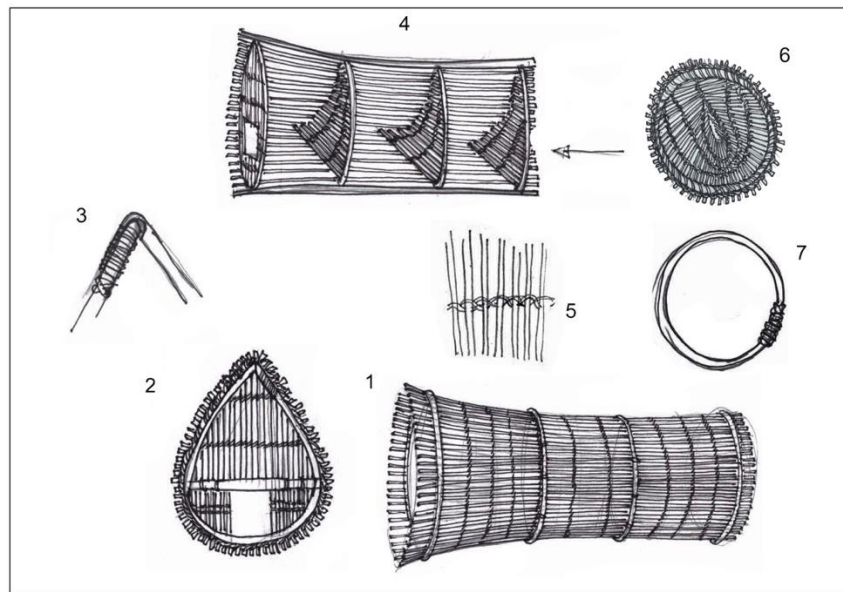
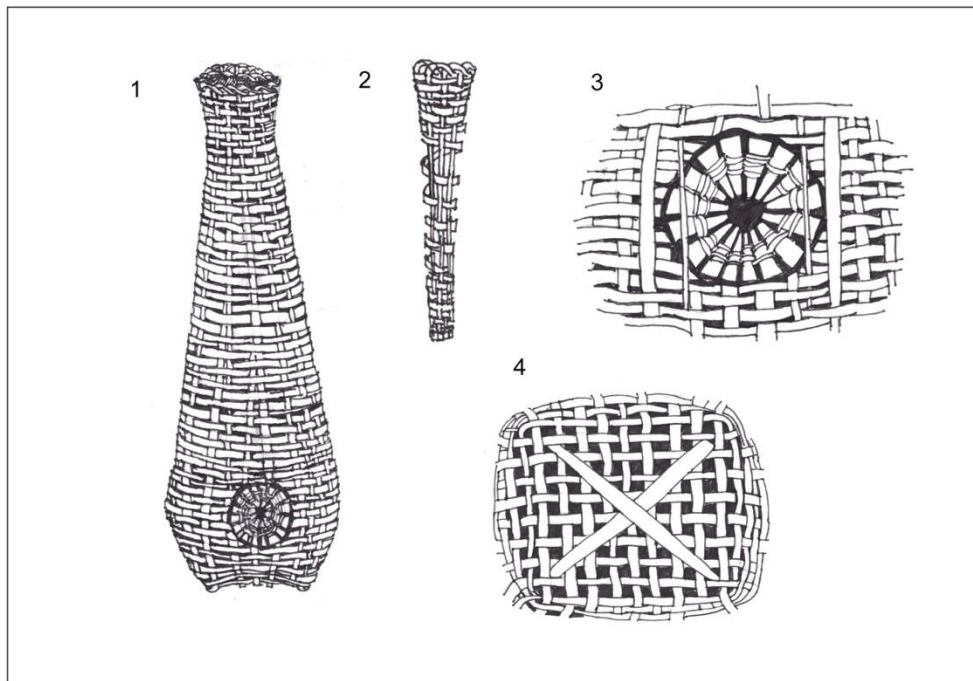


Figure 28 Features of horizontal cylinder trap

Wickerwork fishing trap woven with bamboo in a tight knitted pattern, formed into a cylinder shape with double trapped door as fish can enter through a one-way door, but remain trapped inside. The effective method is to completely submerge the cylinder trap underwater, lure in the fish and allow it to swim within the trap compartment. In case as the fish attempt to swim against the current to escape, it will eventually flows back down within the inner compartment as each entry can only opened one direction– into the inside. The shape of the trap and the frame increment spacing are also depend on the type of fish to capture (Suwan Kongkhunthian, 2020)

## 2) Spherical Trap



*Figure 29 Spherical Bottle Trap Phetburee Province.*

Spherical Bottle trap made from bamboo shapes like a bottle with thin neck and spherical bottom. Crafted with one small hole as an entry, and equipped with lock wooden rod to prevent fish to swim out. At the top lid, also has an opening where it become useful when trapping around estuary. Laying this type of trap also required building fences to help guide the fish into the trap. By placing the proper increment to form a tight fence-path into the opening of the trap, the fish will swim upstream right into the bottle trap.

Other way to set this spherical bottle trap is to place it in calm water, and lured the trap with rotten fish-head inside. As the aroma spread, the fish will follow into the trap as intended. In all, to set the bottle trap, it must be submerged into the water but left the opening lid above the water level for access when full. Therefore, the work also started with the knowledge of the water depth in various spot of the region.

A similar trap to spherical bottle trap from other region may take up a different form and name such as Squared bottle, Frog leg, Night bottle, and Horn Neck (Leesuwan, 2015).

### 3) Tubular Trap

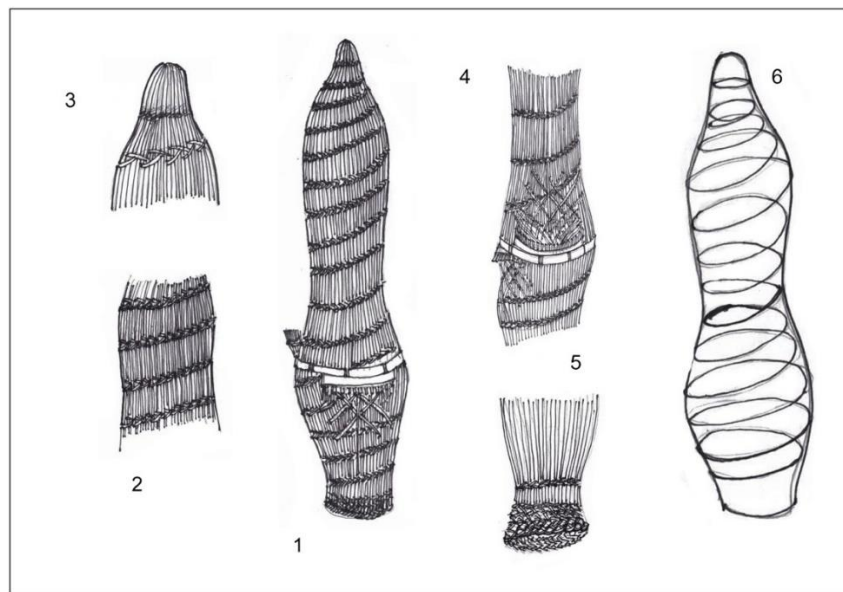
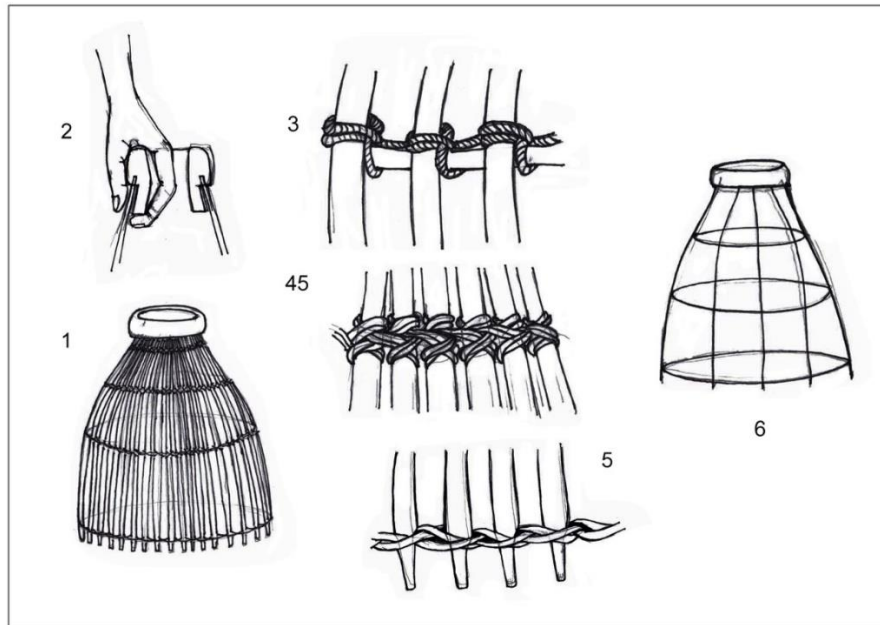


Figure 30 Tubular trap: shrimp

Tubular trap is a woven wicker crafted to catch shrimp. Woven with bamboo and rattan strip, tubular elongated shape with the neck narrowed down like a bottle. Not known to install with teeth at the entry point, but located inside the tube. Normal design is in a small size, made for trapping shrimp by submerging by the waterway, placing along with woven fence strip to guide the prawn into the trap. At the lid entry, grass is applied to prevent the catch to escape. Occasionally, used grass and mud inside the trap, to attract the shrimp inside. This craft is suitable for small size shrimp around agriculture or estuary wash-marshland (Leesuwan, 2015).

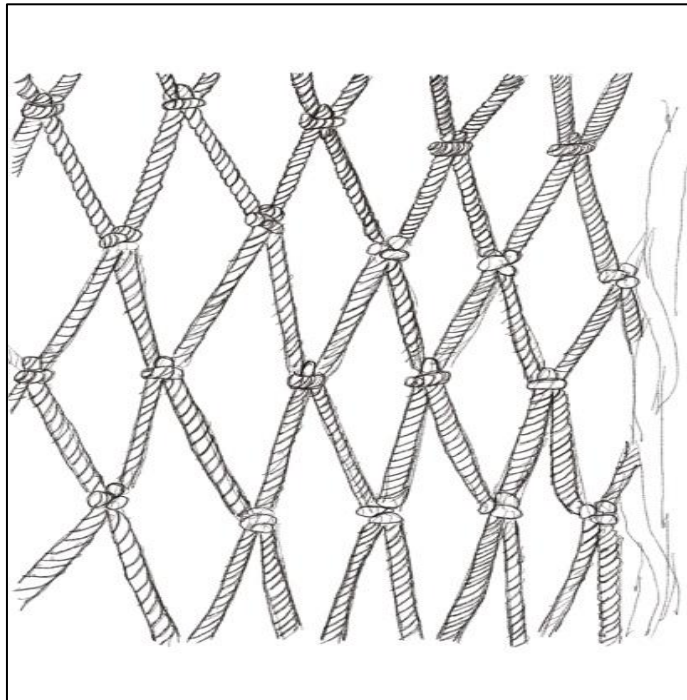
## 4) Conical Trap



*Figure 31 Detail and Features of Conical Trap.*

A large size trap, woven with wide opening radius, top is crafted with wooden lathed cap and woven strips for secured form. Sharpened to strips arranged in circular frame around the cap and use metal rod bend to a circular shape from small to larger radius according to the preference use. Normally a large size trap and quite strong for fishing industry and popular in the central region of the country and sometime called Conical Bowl Trap (Leesuwan, 2015).

## 5) Netting



*Figure 32 Seaman Netting*

From the past until present, Thais has always settled their lives around water passage, canal, and river. This way of life has encouraged lifestyle of refining the all possibility to seek local natural resources for food. Naturally, fishing is a logical choice and crafting tools and fishing equipment such as net, swing net, netting traps, which are important devices helping ease the job and save time. In the past hand-woven net was highly valuable known for durability due to its thread color dyed quality and size variation The natural color dye came from persimmon and wooden sap and finished with sun dried. However, there's a growth in the industry, many seamen turned more to synthetic net because it saves time and more stronger. Net and netting are different based on the following details and explanation:

- Net is a large fishing device, with extended netting sheet or spread to surround the school of fish.

- Woven Knitted Net is fishing device that weaves into patches, spread out by thrown into the school of fish.

#### Type of Netting and Woven Net Trap

Net and woven net produced from 3 type of fibers, which are Monofilament, Multifilament, and Parliament. Characteristic of woven net comprised of numerous patches, between each patch increment will be tie knots with width and length depending on the task and usage and descriptive detail as follows:

- Filament fiber, patches, knots, colors, thread, fiber thread,

Details:

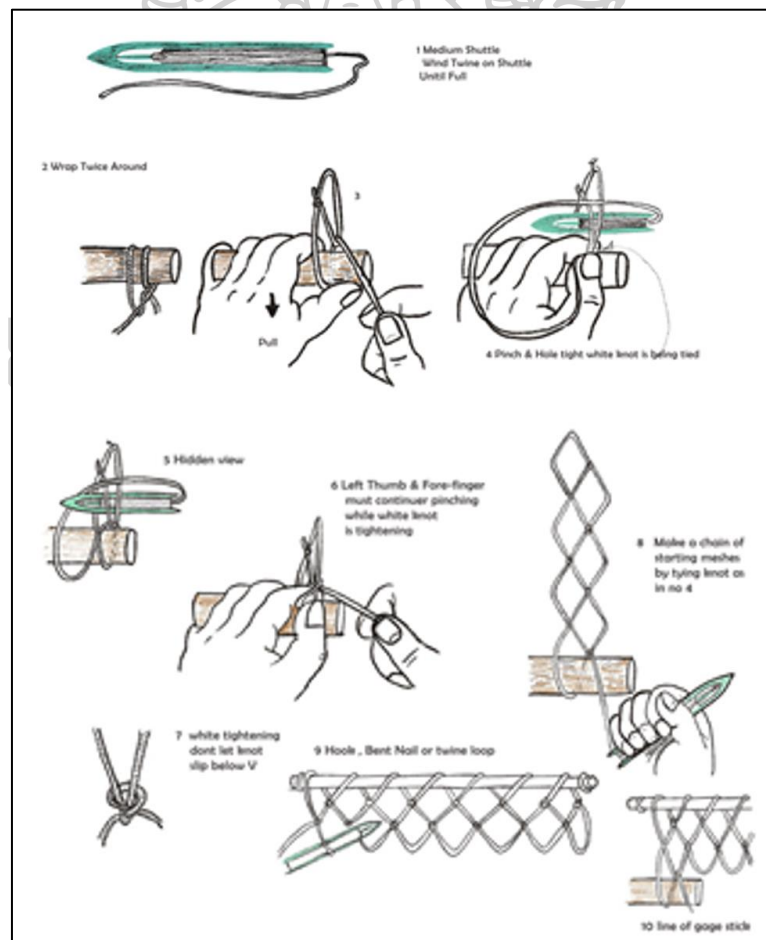


Figure 33 Net and Woven Net

### Structural procedure of Net's production

1 The filaments are categorized into 3 type- Monofilament, Polyfilement, and Multifilament. Single strand filament is normal white in color, a bit shiny, with normal production diameter of 0.10-1.10 mm. As for polyfilament the color is also in white, appeared like a twisted flour dough, commonly called nylon. The filament that use for net production assigned number 110/2, 210/2 to 210/24.

2. Joint as a pivot position to run all the strands for weaving net. the joint has two characteristics:

Single Knot, which single cross tied.

Double Knot, which has double cross tied. High strength and long lasting, of which most export nets are made with complex woven technique, using double knots

**Color:** net's tonality resonates its color through life of use. Color variation revealed through various task, orange and white for shrimp and prawn; white and blue is for freshwater fishing; black is for deep sea fishing; and beige is for mackerel fishing.

**Woven Net:** portion of making the important component of the netting, made from filament join with knots and patches compose to a rectangular shape.

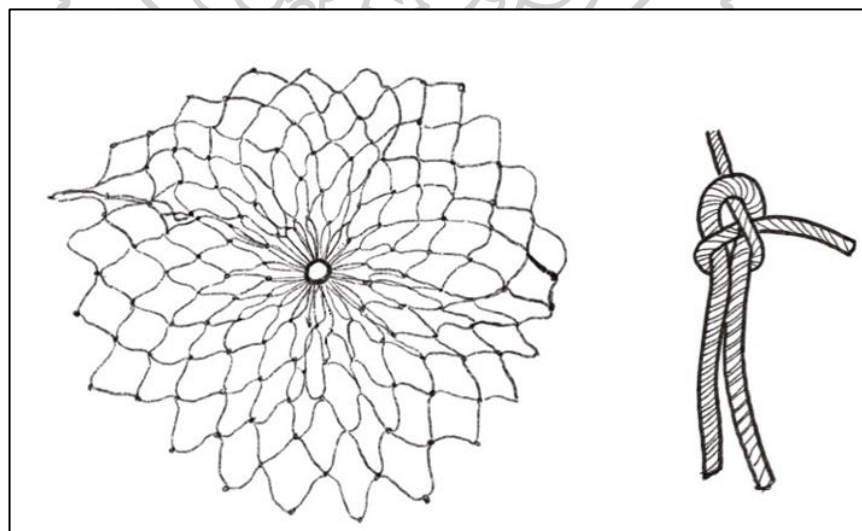
**Patches:** as a component of the fishing net with joint to knot ties from four corners. When the filament threads are pulled the patch will set at a square, even from all sides. There are two way to categorized the patches dimension: Metric and English System, where numerous countries in Europe as well as Thailand are keen with metric system to indicate the exact information of the nets following: size of the filament, the patches and amount of patches, and length– written Mono-Net 010 2.0 x 25 x 9, which meant Mono-Net made out of filament size 0.10. There are two type of Nets:

1 . Yogo-Net with characteristics of patch woven and preserved baked according to depth level, which has 2 type of filament; Monofilament, with both single knot and double knot. Multifilament that contain both single and double knots.

2. TaTae-Net with process of unwoven patches, preserved baked according to length; comprised of 2 types Monofilament and Mutifilamt categorize in 2 type of single and double knots as well.

#### 6) Nets

Produced through baked process according to the length, and preserve on bases of the depth and collaging complexity. There are 2 types of net components used in production today, which each type catered to the method of use and knotting style. First, is woven knotted (Full Weave), which made through body of knots patches to create a surface volume. And the other, is knitted knots (Patch Weave), made by combining existing knots loop and tie them into patches.



*Figure 34 Net and type of Knots used with Patches*



There is various type of fishing industry tools and equipment, some are in constant redesign according to use of each region community, thus drive the invention of many new tools with new ways to categorize them. For example, arrangement from type of fishing location such as: fresh water and ocean with traps and tethers, and arrangement from the type of materials such as nylon into netting, catcher, and woven net (Center of Oceanic Science for South East Asia, (online) 1986), (Fishing department, (online) 1997).

### 7) Pole Traps (ไม้จ้อง)

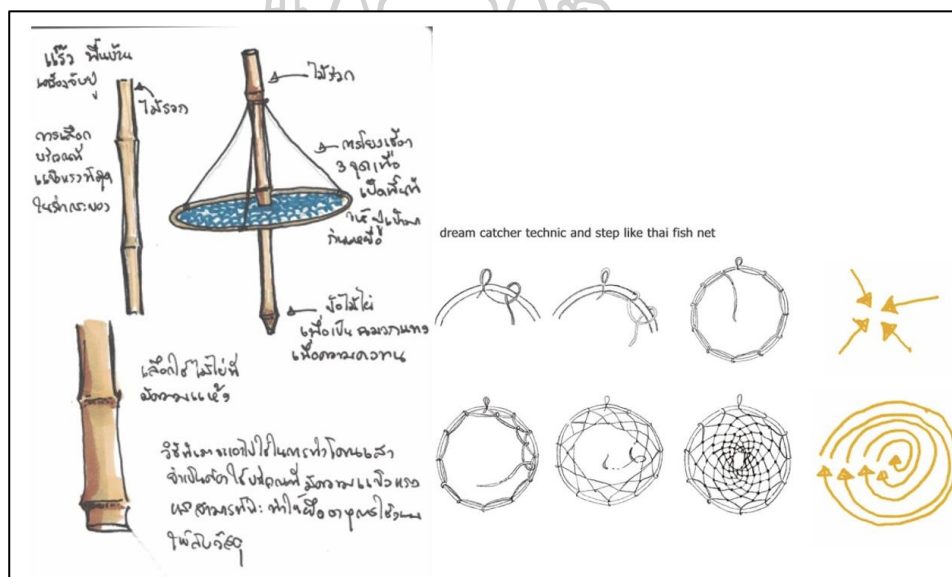


Figure 35 Pole Traps: with bamboo and netting bag

Pole trap is used to capture crab, with the weaving technique that start from the outside radius and working toward the center. This practice is similar to the west with the crafts of dream catcher, thus accentuate on the extensive use of craft idea to other area of creative process.

## 8) Result: Tying and Knotting Fishing Net

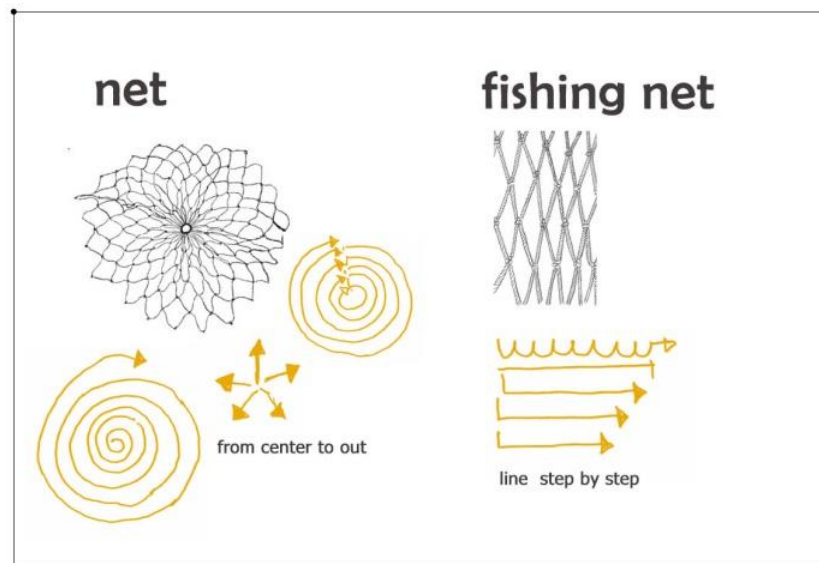


Figure 36 Various method for Net and Fishing Net

The method of woven fish net, netting, and nets are variously different in technical aspects. Fishing net are woven into elongated shape, suitable for trapping in rows. As for Net, a circular weave from the center and rotational weave outward until reaching the expected diameter. For both type of weaving, the skill of tying used loop knot and turned to patches depending on the size of the catch.

#### 2.1.2.4 Furniture functional products as chair, hammock, and bamboo bed in Bann Laem

Furniture making for the local seaman at Bann Laem, commonly use rope tying technique to create a functional piece. Ever since the earlier year, to protect the infant in a hammock bed made with fishing net woven technique, displayed a technical craft that may extend into a large-scale idea expansion, such as: folding bed, portable furniture, and certainly net weaving. In the research model, which set the time span of 30 years, a child upbringing from young age to the working age, to now the younger sibling can still

use the hammock bed. For the aspect of net weaving, where the feature in folding notion of packages that eventually able to bring out for reuse.

Products that design to support the ease of use in daily life are commonly pertain hammock bed that resemble fishing net but use natural fiber from water hyacinth. The bed revives the nature of life reflect “day rest after work”, thus extends to the design of fish drying rack for ocean products for resting the fish to dry.

There are topics aim to study the technique and methods for experimentation in creating products for home decoration and creative interior design. This technique has story, context, elderly wisdom, and way to draw interest, whereas bamboo selection, tying knots, modification, additional strenuous features, absorption, and employing natural materials, to eventually increase value of local knowledge back to the community sources.

The study of product research that derived from skill of tying knots with rope or rattan or other natural materials to create form and household objects for use in the daily life. A notice announcement from the Industrial Product Standard vol. 2001 in “Renouncing and Indicating Local Product Standard: Bamboo furniture with definition as furniture made from suitable bamboo to utilize processes in cutting, bending, stamping, engraving, lathing, assembly, refining, or others, to sustain desirable form, woven, fold, knit, washes, or color upgrading, may gone through material decoration such as rattan, wood, rope, metal, fabric, all to enforce durability and aesthetic functioning such as table or chair.

## 1) Child Hammock



*Figure 37 Child's hammock*

Hammock used as children's resting product, squared in shape made with wooden frame and woven patches on all sizes with rope. Foldable when not in-use, a flat board supported for the bottom to place mattress. Patches woven in close or wide increment as preferred to prevent child from falling, appeared similar to fishing net, riveted to the center of the bed and tie rope to hang on the ceiling beam for support and to let the child rest during the soft sway.

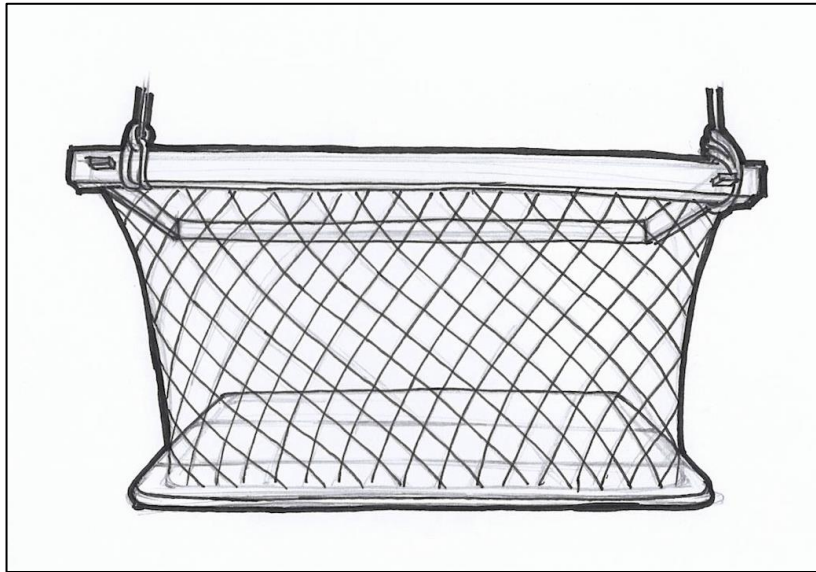


Figure 38 Squared Child Hammock

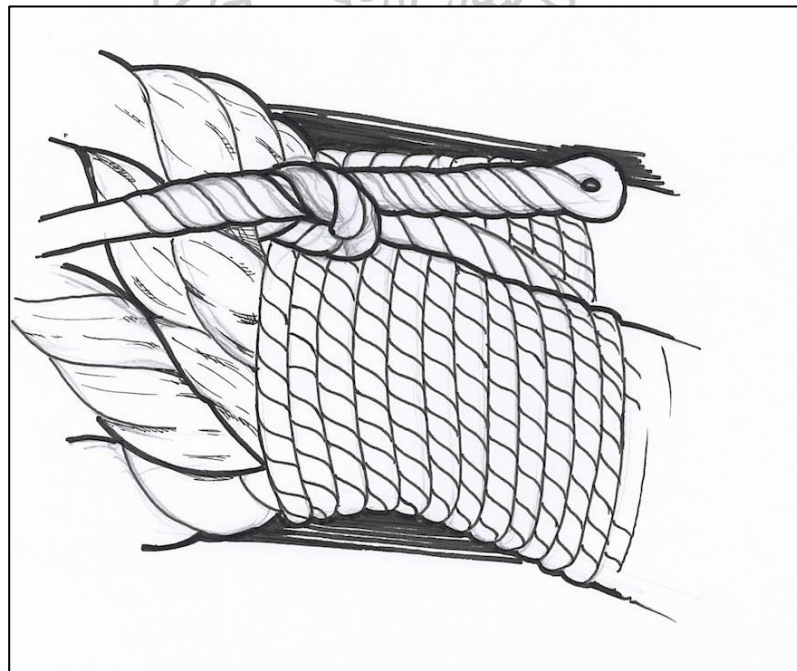


Figure 39 Cork Lock Knot Tying

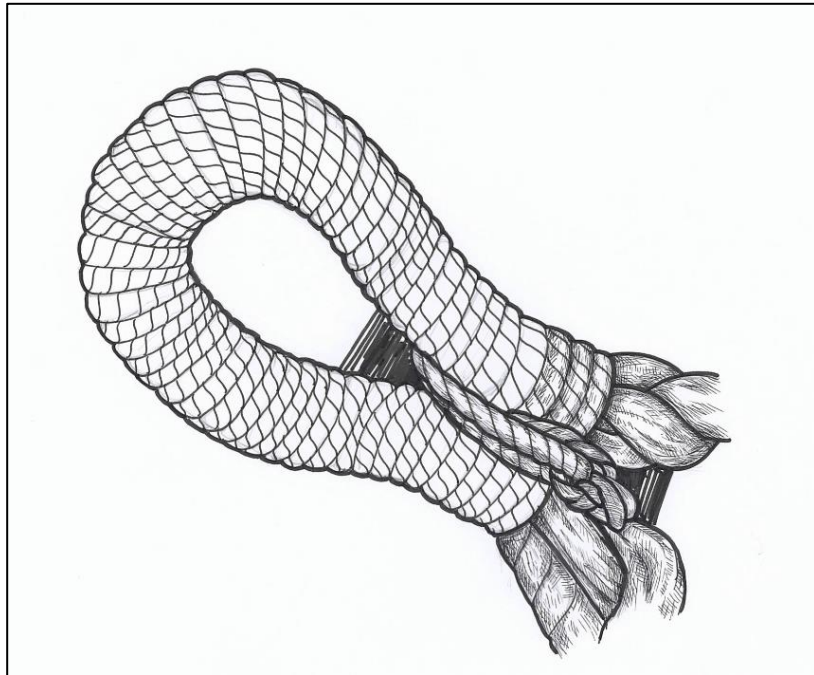


Figure 40: Loop knot

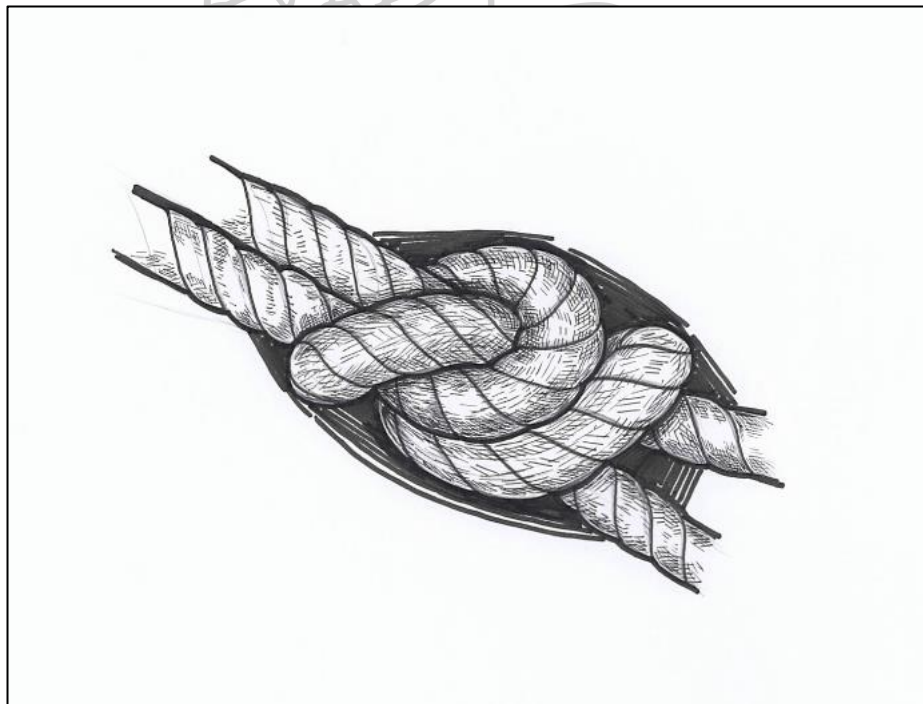


Figure 41 Twisted Knot

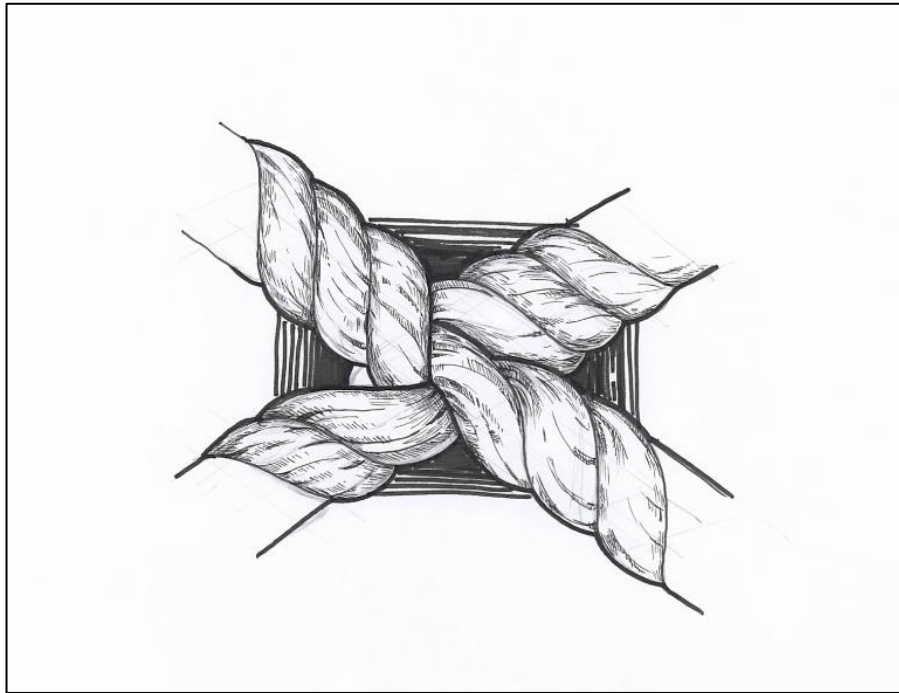


Figure 42 Crossed Knot

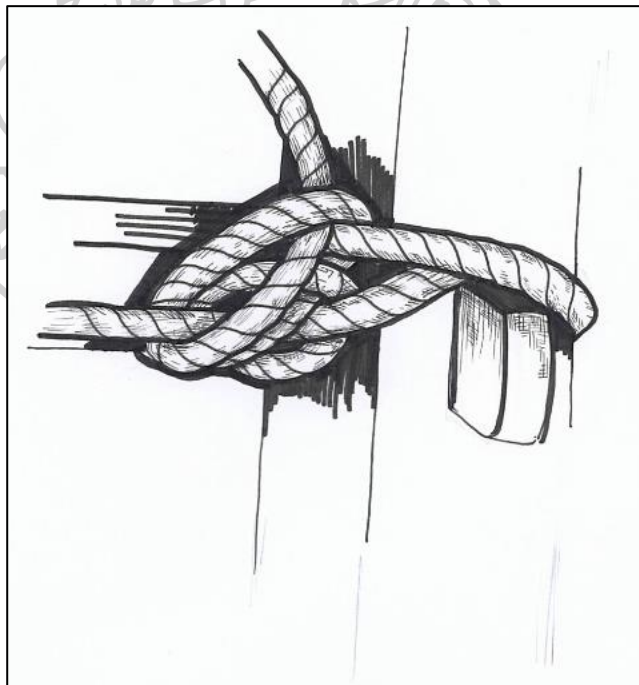


Figure 43 Connector Knots

## 2) Garden Hammock



*Figure 44 Hammock in Suspension*



*Figure 45 Detail Garden Hammock*

Hammock woven by rope, hyacinth, or hemp, fabric, thread into big patches. Used by tying the hammock's head and toes to create a rest space with soft sway. Weaving natural filament is similar to weaving fish net of large patches and twisted knots.



### 3) Fish Drying Rack

Fish drying rack in Bann Laem made from bamboo and rope that pertain a tying technique from the fish net with tying knots and hooked knot, Twist-crossed knot, and woven all together to create the tools.



Figure 46 Drying Rack

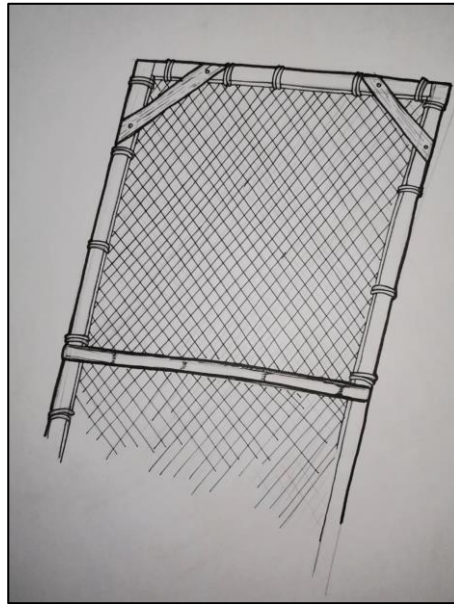


Figure 47 Drying rack: backing

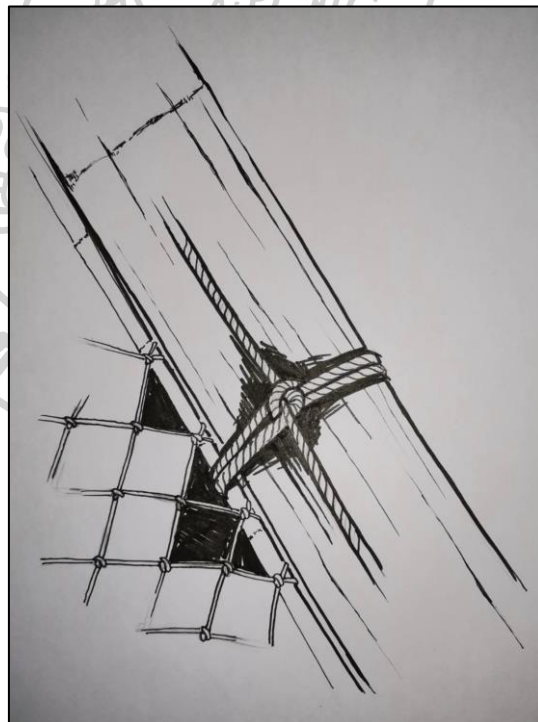


Figure 48 Detail: knots tie weaved holding the Patches

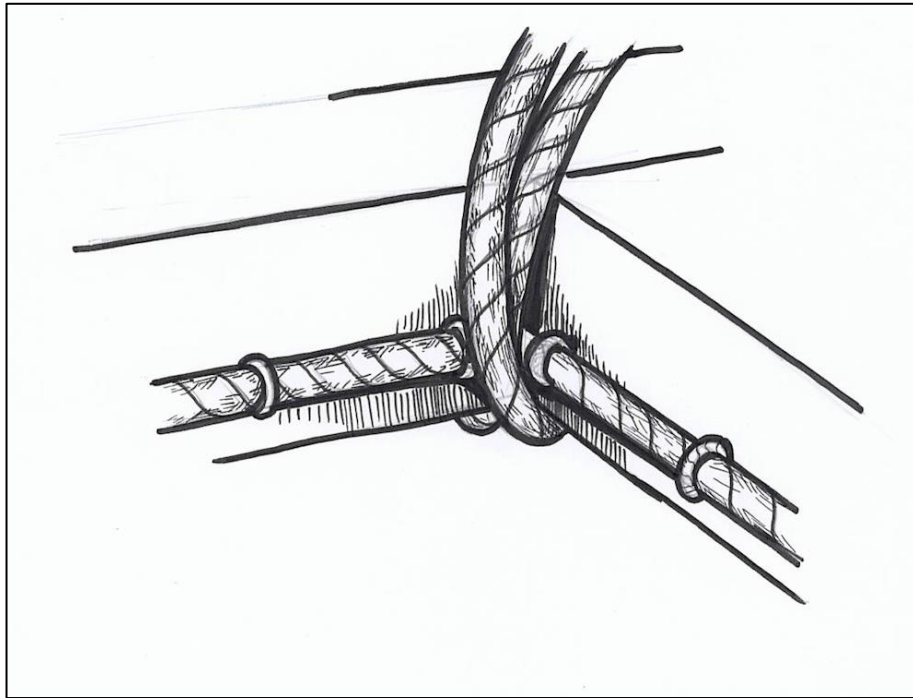


Figure 49 Under-over crossed knot

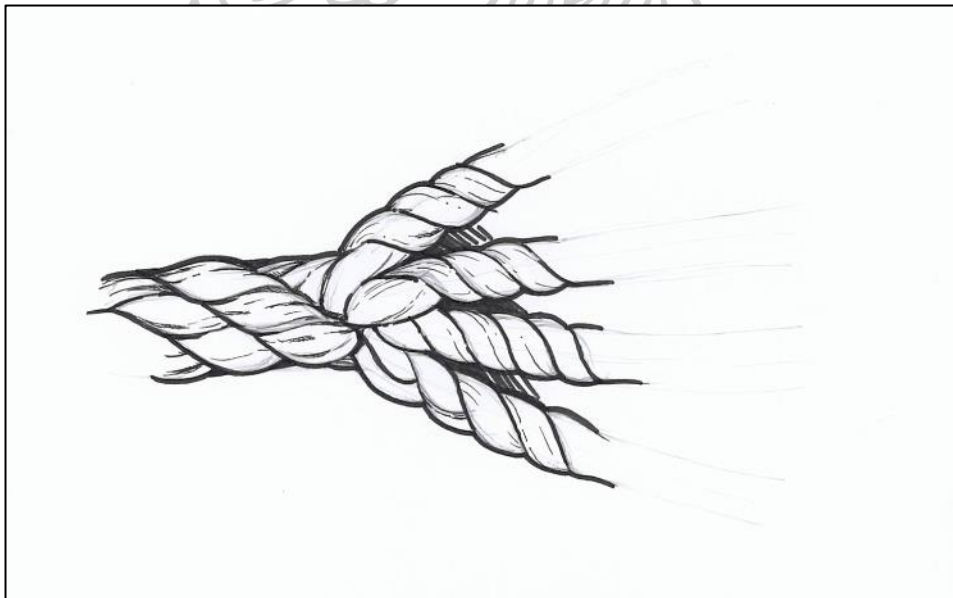


Figure 50 Split Knots

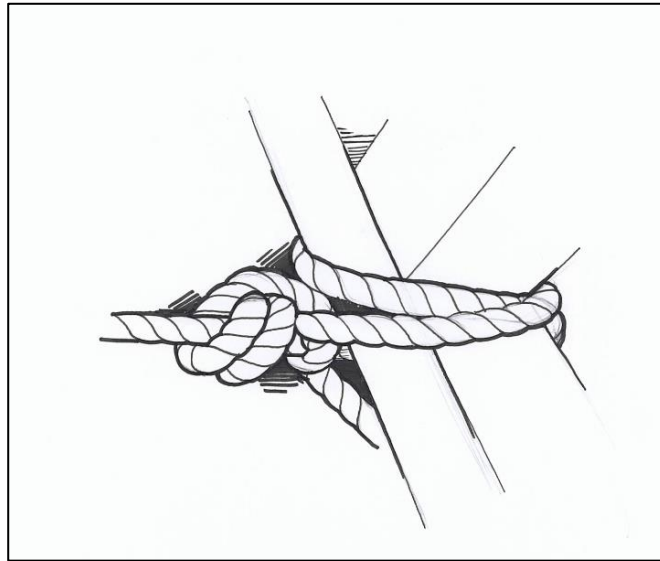


Figure 51 Knots: Hooked knots for pull

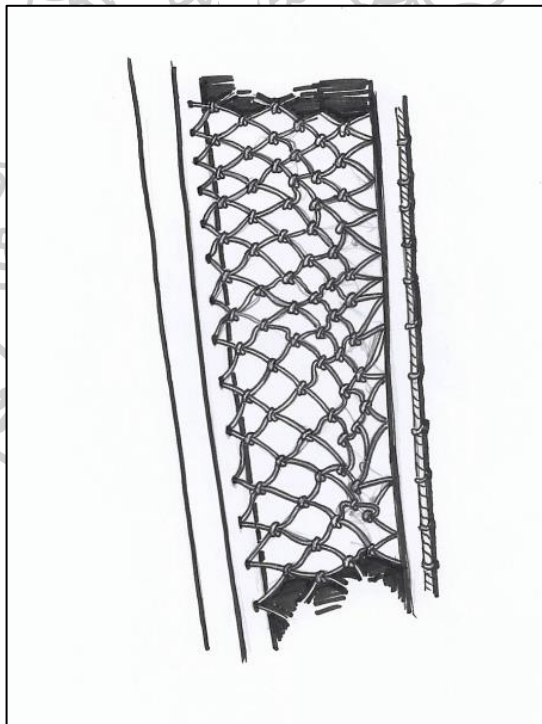


Figure 52: Features the full Patches Net

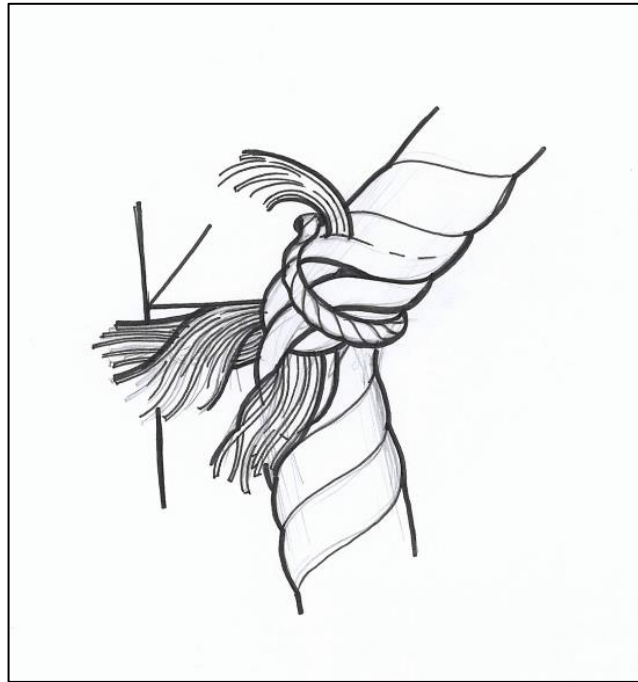


Figure 53 Twist and Tug

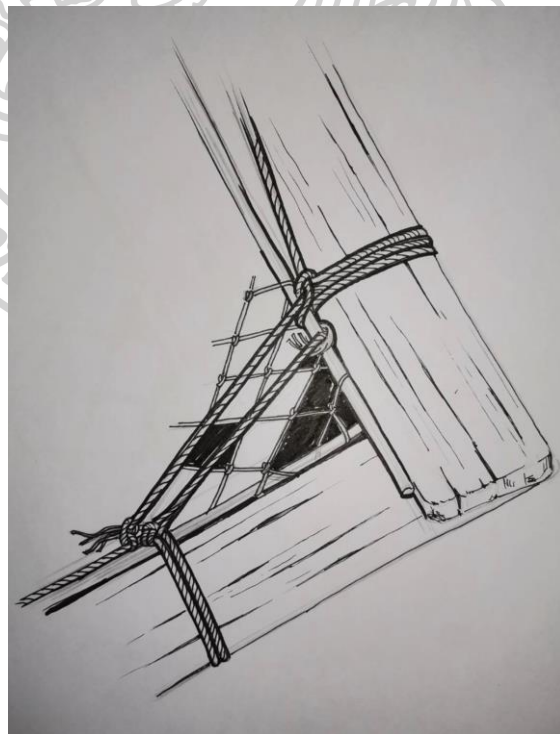


Figure 54 Hammock corner refinement weave

### 2.1.2.5 Conclusion

In the study of woven and rope tying of handicraft within the local community in Bann Laem; comprised of kite, wickerwork, fishing traps, and furniture. Reviewing as well in absorption and define the ways of knot and tying techniques that selected to recognize beneficial skills as follows:

- 1 Structural form to support human weight
- 2 Methods to rectify specific cultural identity
- 3 Capable to entice skills to collect necessary project details
- 4 Creating methods to enhance and ease of function use

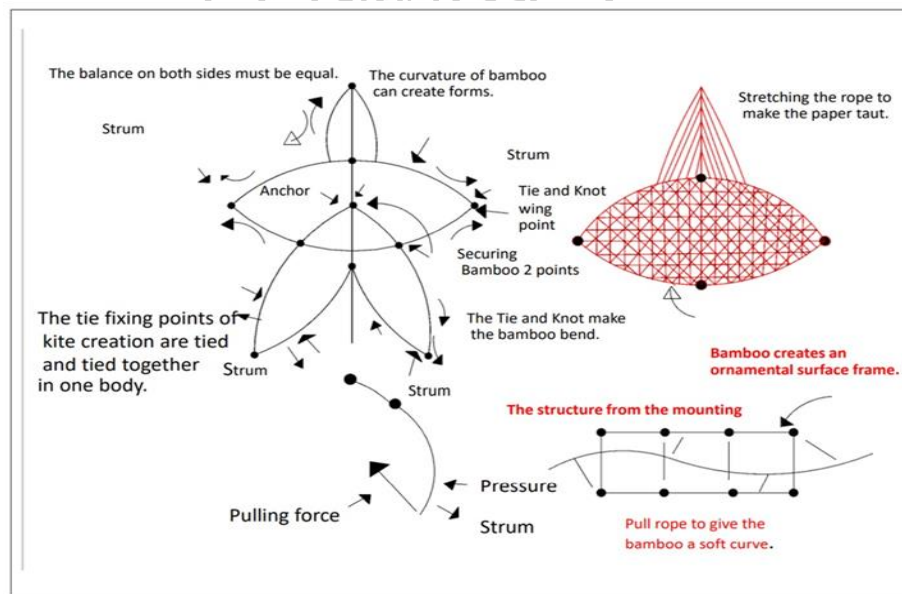


Figure 55 Tying and Stretching Selected Kite

The balance of pentagonal star shape equipped with five ribs frame, griding shape into flat pentagonal corners. Structural form pertains tying joints with structural points. Accordingly, characteristic of pentagonal and blowfish kite is mainly for "Battle",

with skills in creating imagination and planning on the structural design that also personify story and various meanings. Most of the design content expressed through the tying techniques, which demonstrate by tying connection that formed patterns related to the technical position of the tying string of about 3 inches blocks to help control the kite frame for better movement. On the pentagonal star-shape kite, choice of paper was used to create pattern, where each section of the kite is decorated and also enhance the structure by the using sugar to help bend the accentuated curves. This quality pertains the kite to access better chance of catching the wind during flight, resonate the extraordinary form in flight that appeared in the skyline unlike any kite anyone have witness before. Eventually, this idea is transfer to construction form of x and y axis with precise calculation for kite flexibility.

Tying wooden frame together normally would use crossed knots as the main fastener for its frame. Breast alignment section also employed crossed knots where the middle used crisscrossed tie to hold all sections together in a harmonious way.

Way to tie wooden piece with rope, can be seen at each of the section tips, where tail can be added to enhance better direction controlled.

Tying the wings section, using hooked knot tie (male tying) where this character will enhance the wings to perform to its maximum capacity of how bamboo is flexible not rigid in movement.

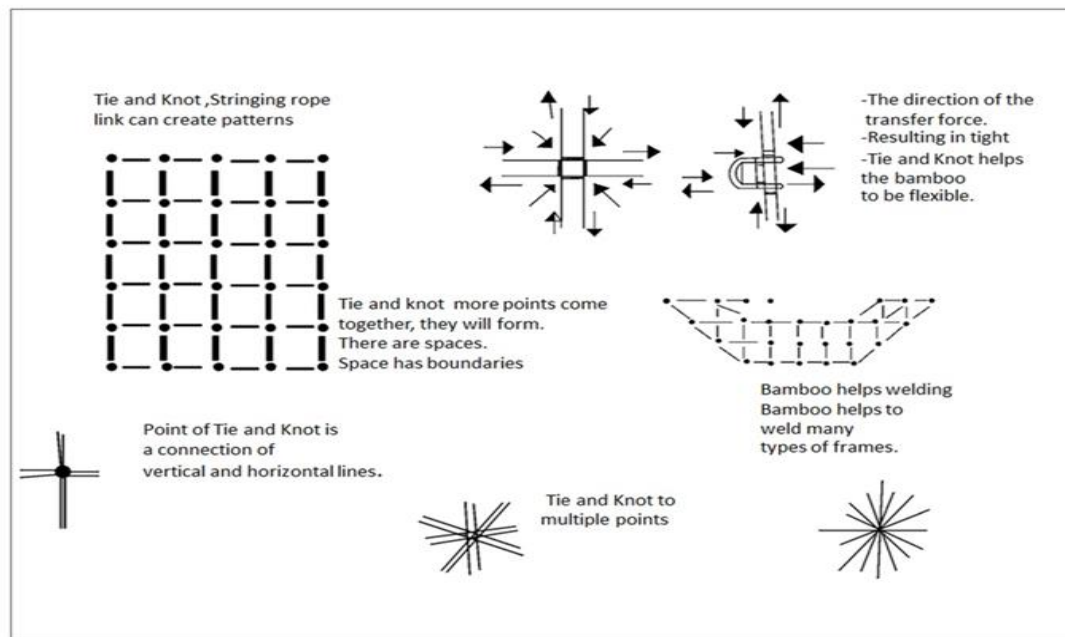


Figure 56 Quality of tying techniques for strengthening the frame

Methods of rope tying to create patterns may have calculated for increment, distance, spacing, rhythm, and lines spacing. Thus, allows for gaps and negative space to be a creative area for craftworks. This area mentioned is where the tying and knot techniques generated a form or shape that in-depth recognition may transform a limit without constraints to creative thinking.

Tying points vary in types, knot networking, pertain a form of pulling stretch, and specific area compression, of which transfers to support, to force tying spot into restricted tighter position, and straight fixed of force sustainment.



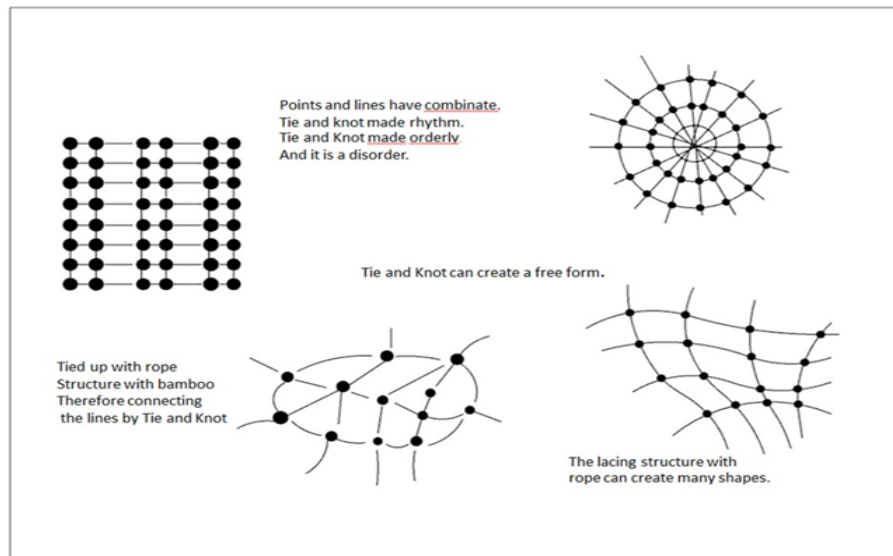


Figure 57 Independent Tying Frame and Arranged Tying Frame

Combining materials lines and points, may justify empty space into a creative/ crucial position. As rhythm initiate boundary, grouping, structure, points and lines cross path to result in power. This idea of energy may bring into an objective idea, organize to disorganize to any means of creative communication. The extraordinary visual of lines and points to yield a square, a triangle, or an ellipse, the cross section then fill in that void to create more meaning. the variation of lines size, section that have constrain, shape with different negative space, materials capable of forming circle, void of circle that lines generating is natural, arranging line to questioning the straits may varied.

## 2.2 Wisdom of Knots and Tie

The knot and tying techniques have been around for thousands of years and is something that many people do not appreciate. However, often used in daily life from functionality to artistic techniques, knots are an indispensable tool for those dealing with daily life situation or any creative project or task.

What is a knot? A knot is a fastening made by tying a rope, cord, or woven rope bound in several ways, and each can have different purposes and intention. Each objective allows the crafts to develop with additional inventions and techniques to improve the way we conduct our tasks. Earlier on, cars, subways, trains, planes, ship or animal transport were a daily event that involve the use of knot tying. Tying and secure pet's collars and tying boats to keep secure on the water is essential to prevent them from running away or washed away from strong currents. A simple knot meant a difference between keeping or losing something significant, where its knowledge and roles help us to think creatively of how simple knots can solve problem.

The Bowline Knot was the most popular in a boat tied, and it has been around since Egyptian time. Over time, hundreds of knots have been invented, ranging from superficial knots that take less than a second to more complex knots and required step-by-step instructions the research generally agreed that the most comfortable and most used is the hand-operated one. Some of this knot is used every day and often used as a stopper. Whether, tying a balloon, sealing a bag, or tying the ends of a string to keep it from loosening, can use the knot to handles a wide variety of items.

Humans were known to use the terms in their life. Using natural fibers Whether it is a vine Bark pulp to make a rope to tie the rock or hard materials that occur naturally. Then used as a hunting weapon as we can see in many documentaries. Later, as human beings in different ages grew more, rope and tying techniques became integrate into other form of functional benefits. Therefore, began to use a rope made of such material to tie, to bind materials such as bind logs, bamboo logs, for use as a vehicle to propel a living, hunting for food both on land and water.

Different knots have different attributes and functions, such as mountaineering or sailing. Knots are also regarded as having spiritual and religious symbols in addition to properties. Aesthetic The boundless knotting appears in Tibetan Buddhism, for example, or in different cultures, often symbolizing unity.

Besides tying and knotting for livestock use, other practical uses of tie knot include bow knot or lan knot, bowline knot, and hunting or setting. Camp (Slip Knot) The knot is used all the time in arts and crafts such as the macramé Macramé has been around for a long time, but it recently became a staple in its invention 1970s. The most popular macramé are Lark's Head Knot, Square Knots, Spiral Stitch, Clove Hitch, and Overhand Knot, representing a pearl of wisdom and knowledge passed down for many centuries. It is an artefact in the outdoors or daily life. The knot is a very functional and artistic tool that has been of great importance to people for a long time.

Characteristics of knot and materials can be extract of its technique and methods to justify its benefits: as an initiate for design creativity and decorative arts. Factors used are the methods of tying that is basic, apply for suitable functions as for pulling, tying, straining, for propelling design direction or decorative idea. By using rope and bamboo to enhance the potential of the combination in structural integrity, innovative idea, or sustaining forces level, that include the development of alternative and comparative material to increase more of its capability and functions. Studying the process and methods from indigenous products such as kite making process that crafted with several knots and rope tying, bamboo use, and paper application, woven fishing net, wickerwork, and furniture design, all can help refine the direction of decorative arts and household products.

The study of tying knots with bamboo, rope, and paper is most effective when each factor is critically extract of its quality then brought back together to help lay the boundary of the effects. Each traditional crafts product used materials that support how found local resources help us to reconnect to what are closest to us, related to us in way to best support our idea and creative process. For example, the tying techniques discovered around the village can be first source of inspired application. By bringing its techniques and features: how to tie and bind rope with bamboo, how to make kite, to weave fishing net, how to estimate sizing wickerwork, and elaborate furniture process, can all be a direction to extract the meaning of tying technique application into the

decorative art, interior design, and creative design. But maintaining the integrity of its traditional and cultural essence, by having the study emphasize of skill and wisdom in crafting the daily use object, toys, that can learned of tying and knot selection techniques as seen below in figure 58.

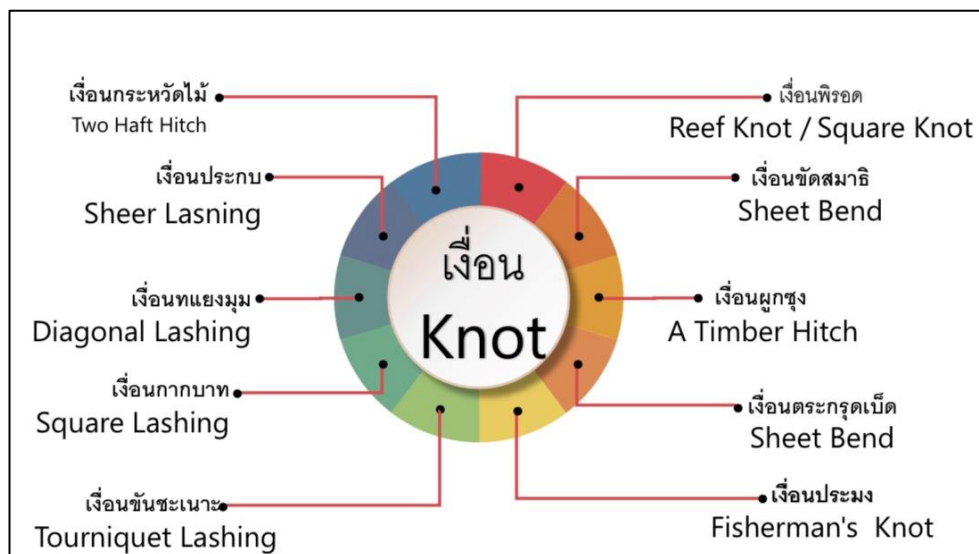


Figure 58. Type of Knots

### 2.2.1 Reef Knot or Square Knot

The reef knot or square knot is a type of knot that is very useful in our daily life. Especially by connecting the two ends of the rope together. This condition is very tight, but it is also easy to loosen and retie.

Procedure and steps from 1-5 are demonstrating how to tie with reef knot, which is basic and not overly complicated. Following the procedure and use it for the benefit of design and creative work. Reef or square knot is commonly found in day-to-day usage where tying two ends of rope together with the idea in mind to be easily untie for adjustment. Proper use is for tying similar material together, of which if tying rope, the crossed dimension, thickness, and tensile unit of the two ropes should be the same. If

use for tying two different type of rope, when fully pulled, might be difficult to recoil or adjust, so it is recommend to use the similar rope for daily use.

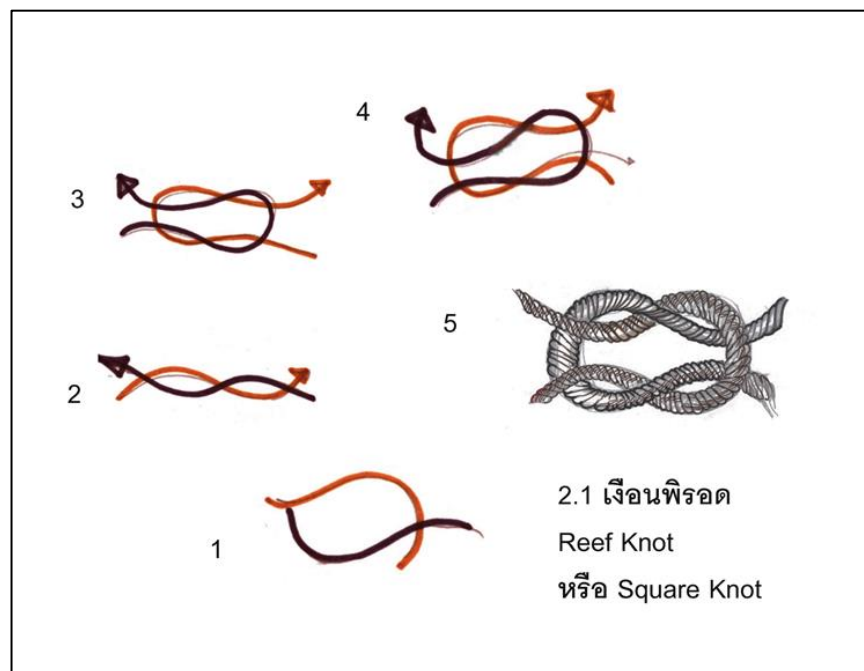


Figure 59 Reef or Sqaure Knot

Steps:

1. Bring one end of rope (right) cross over to the left and bind
2. Returning the rope's end (left) cross over to right and bring the right rope' end insert back to the left to bind as parallel line.
3. Gathers both ends, and fully pull to tighten and arrange the rope for easy access.

Benefits:

1. Binding object and features; shoelaces, or hair ribbon

2. Able to use for connecting two ropes together, the knot resolves in decent size.

### 2.2.2 Sheet Bend

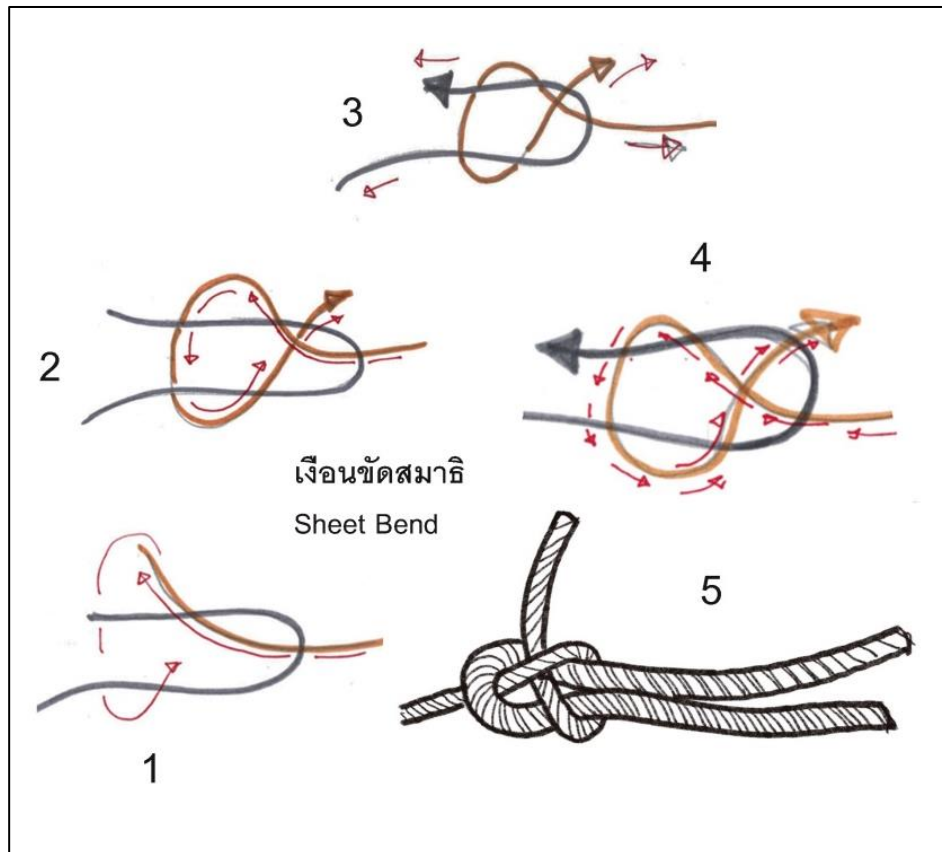


Figure 60 Sheet Bend, or Loop Tie

Sheet Bend has procedural steps from 1-5, showing how to tie, also may use to connect different size rope into one.

Steps:

1. Arrange first rope into a curve, insert the second rope downward into the circle and reversed upward cross over the line.

2. Insert back down toward the curve, insert the bottom into the previous cross rope end.

3. Hold the rope's end up, fully pull and adjust for tightness, and pull into the opposite directions.

Benefits:

1. if rope is different size, bring the bigger rope and mark as loop for to bring smaller one and use reef knot.

2. Suitable for connecting with object with hard condition such as vine rope.

**Notes:** Rope tying in sheet bend for today use, must require the proper knot method, Beginning with having both ends of rope arranged neatly and together. Also, a rule of thumb that when tying knot, should leave some slack a bit longer, preventing runs and split. If rope end is on the opposite side, tight bind because one end is smaller or rolled up within the knot may cause difficulty when unbind.

**Solving coiled knot** first pull a, b ends apart from each other, pulled until straight and then sieve away from each end. Sheet bend is suitable for rope connecting or extension with uneven rope, by bringing the smaller end and bind them around the thicker rope then use the sheet bend knot to close.

### 2.2.3 Fisherman's Knot

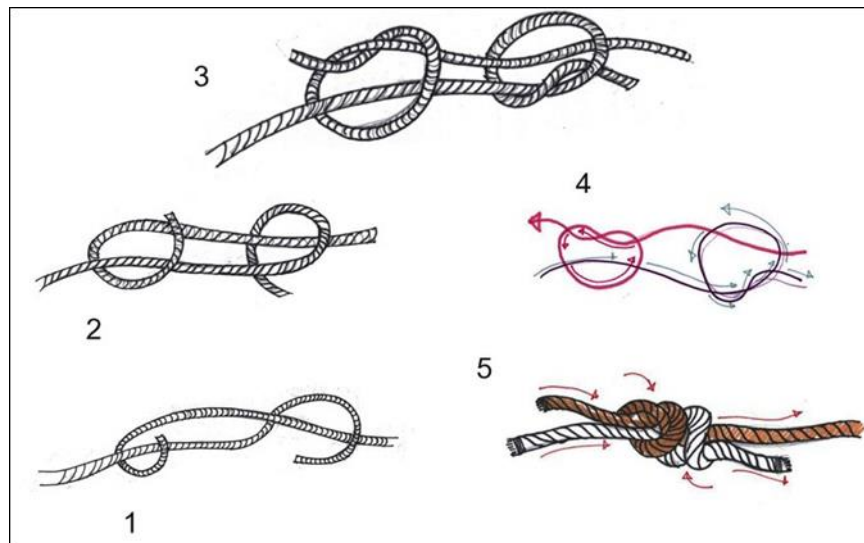


Figure 61 Fisherman Knot

Fisherman's Knot use for rope extension especially for small nylon rope, tying fishing bait is more suitable than other kind, therefore a popular choice between fisherman, seaman in rope tying and extension.

Steps:

1. Bring two ends to extend by the following procedural steps: tie first end into the second rope, then loop over and tie back with the first rope and tighten.
2. Second end of rope, tie to first loop with the same procedure.
3. Fully pull both ropes to the opposite direction and allow for sieve to tighten together.

Benefits:

- 1 Use for connecting small strand rope for fishing bait



2. Use for connecting two ropes
3. Use for tying bottle neck for handle preventing slipped
4. Use for extending large rope for heavy pull
5. Use for binding electrical wires
6. Use for tying the boat, raft, loop, or harbor pole
7. Consider easy to bind and unfold. (Boy Scout Society Blog, 2017).

#### 2.2.4 A Timber Hitch

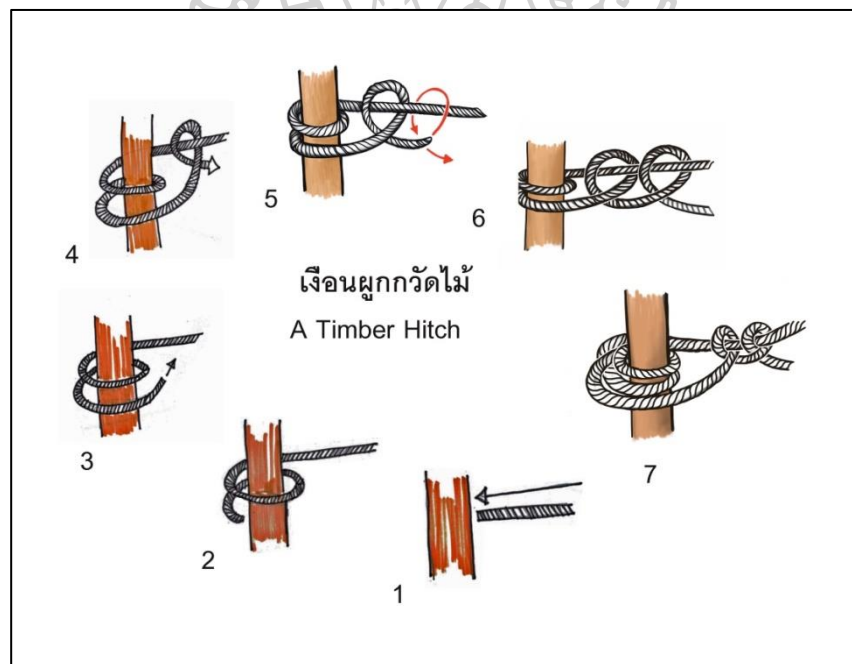


Figure 62 Timber Hitch Tie

Methods of tying Timber Hitch, a knot from the type of hooked knot, able to bind with all kind of rope, all size binding use one end of the rope as double hooked knot tie. If you for permanent tie, must apply dead knot to prevent recoiled.

Steps:

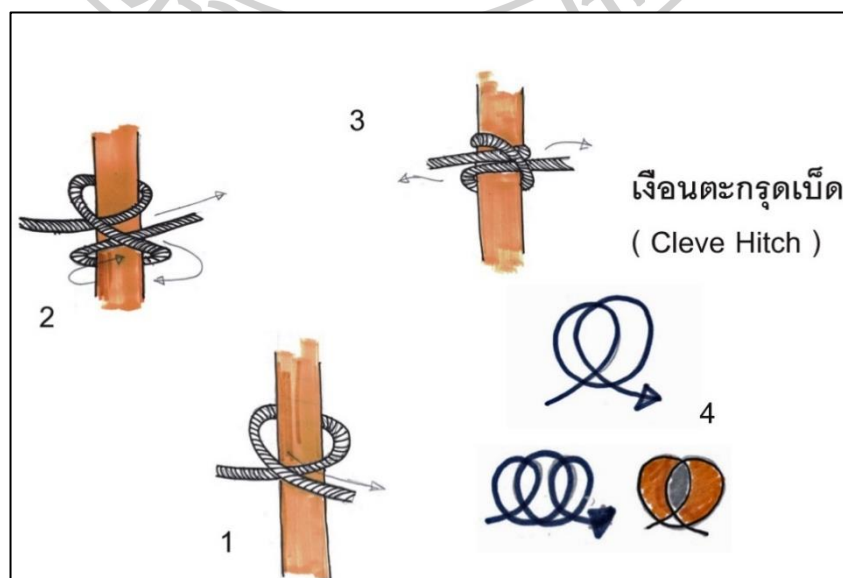
1. Loop the main rope 1-2 times around and insert the rope end into the main rope.
2. Insert rope end into small loop on the main rope again, by keeping separate of its end then insert additional loop for proper secured.

Benefits:

1. Use for tying pulley
2. Use for tying marker but constrain the loose movement.

Timber Hitch tie is considered a tying process for binding object to fixed in one position, stable, easy to unbind, strong tighten hold, and add on into other knots for additional purposes. Timber Hitch is a knot binding that applied hooked knot when tying the main area fixed position or holding object. As used with hooked knot at the end binding, even helps to strengthen the tie more.

#### 2.2.5 Cleve Hitch



*Figure 63 Hooked Knot or Cleve Hitch*

Hooked knot or Cleve Hitch is a type of knot used for camper, tying tents and necessary equipment in campsite as well as seaman task in the harbors.

Steps:

1. Loop the rope around pole toward the back and loop it back to the front
2. Loop the rope toward the back one more time and loop again to the front.
3. Fully Pull and hold tight

Benefits:

1. Use for tying pole or hook for preventing animal escaping, or boat drifting out or loosen, which must bring the rope ends and tie it back one more turn.
2. Use for binding vertical ladder
3. Use for binding metal and construction features
4. Use for tighten binding: crossed bind, crossed tie
5. Use for tying pulley, anchor, ladder steps, and baits.
6. Use for tying boat into pole, easy to recoil but strong (true-intelligence: Scouts knots, 2009).

Further usage for tying in the expedition or construction site, for binding goods package when unload and reload. This knot is also considered to be the heart of learning to tie knots, simply because it's beginning of all knots and tying techniques. A precaution of its use, is to tie or bind around the middle of the rope as using the rope

end might come loose and not tightly secured, when pulled and constant pluck away, the knot would come lose (Khemdeang, 2017).

### 2.2.6 Two Haft Hitch

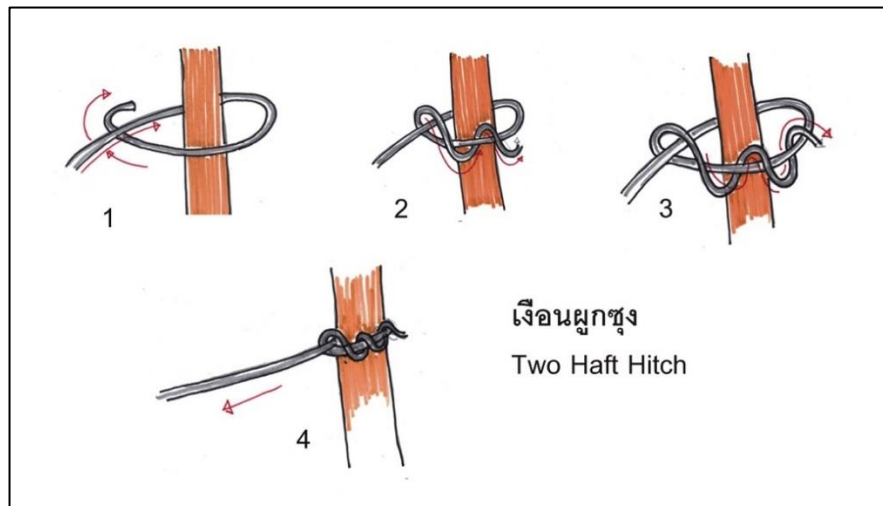


Figure 64 Two Haft Hitch Knot

Is an easy knot to tie and rebind, but hold fast and strong, since using its rope end to tighten the bind, not leaving a long end to tangle.

Steps:

1. Rope end loop around the pole and back up front
2. Reverse to bind and loop rope's end into the main rope.
3. Bind into screw and tighten

Benefits:

1. Use for timber or large circle object or cylinder object

2. Use for bind and hold structure, by fully pull.

### 2.2.7 Sheer Lashing

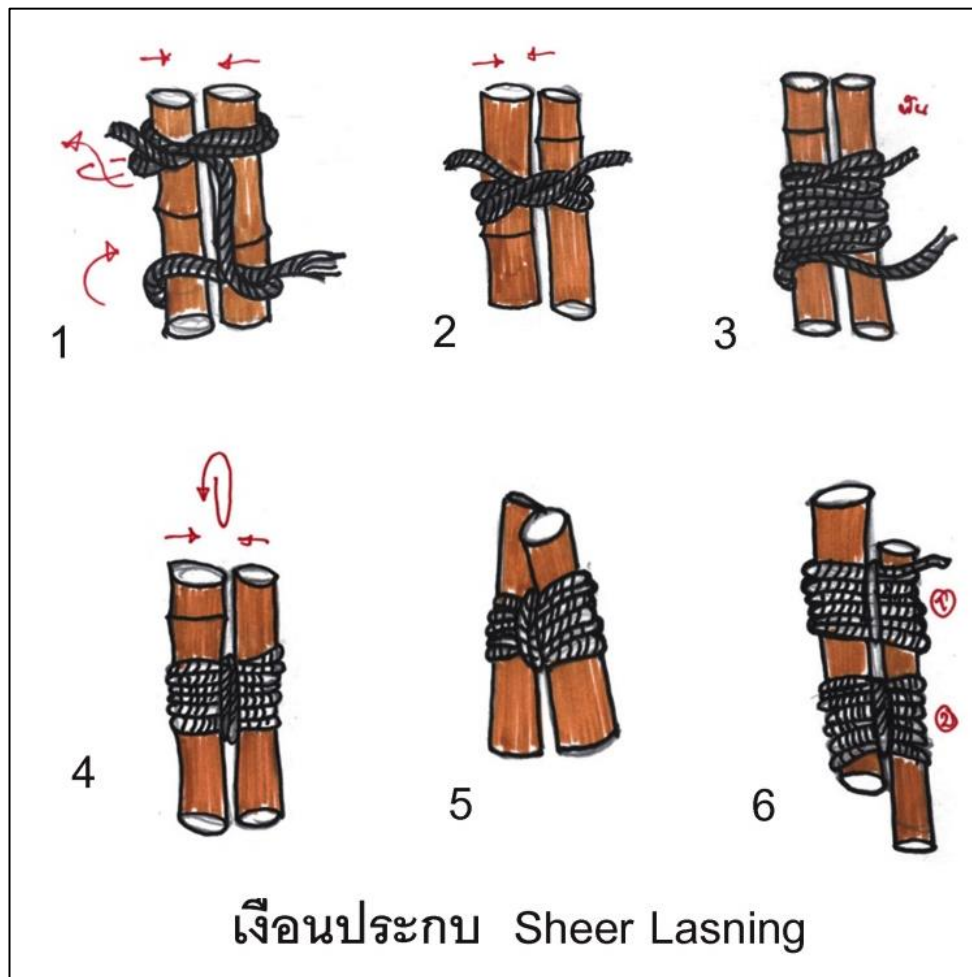


Figure 65 Sheer Lashing

Steps:

1 .Ties hooked knot and pull with rope to hold and fully pulled for additional secured.

2. Ties rope together and loop the lines to align several times and adjust the timber closer together.

3. Crossed Tighten between the log to close the gap by tightening with hard pull to secure.

4. Ended with hooked knot for one additional piece for finishing the rope end.

5. If extending the wooden log, an additional tie is required to fully support the loads.

Benefits:

1. Use for binding structure and housing
2. Use for building a fruit collector stand
3. Use for scaffolding in collecting agriculture farm goods.



## 2.2.8 Diagonal Lashing

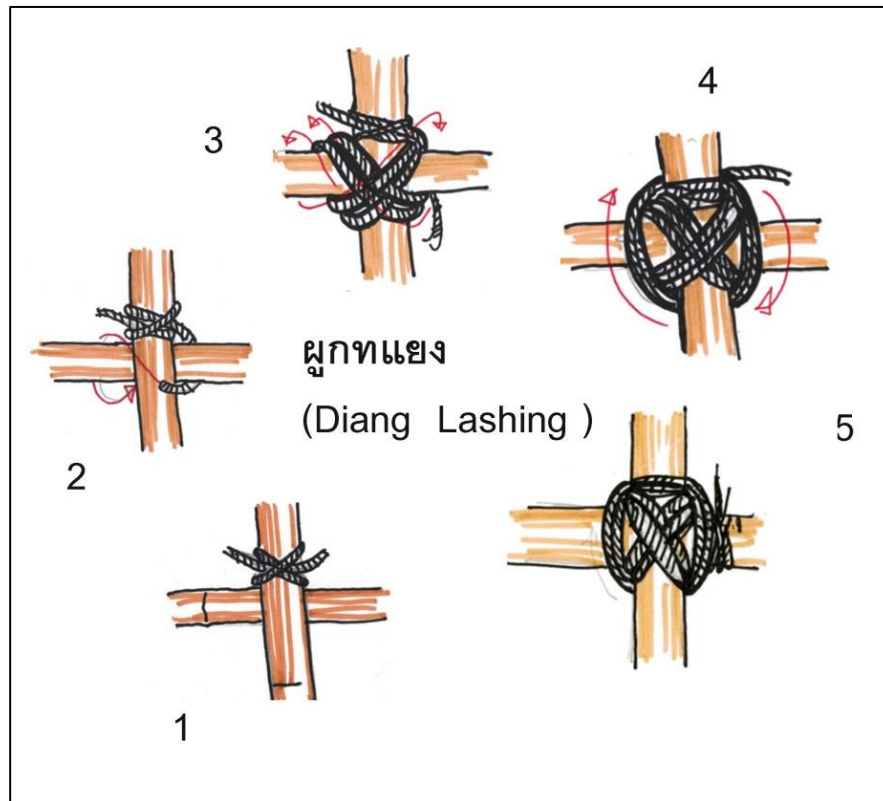


Figure 59. Diagonal Lashing

Steps:

1. Rounded the tie twice around the two poles. At the four corners, crossed all angles with timber knot tie, pull and bind from the opposite ends (diagonal pull) about three turns (each round must hold tight for the pull).

2. Pull the opposite ends, crossing over each corner about 2-3 turns then tighten with dead knot with 3 turns, when done tie the rope loose end into hooked knot into the chosen wood pole and tighten the loose ends.

Benefits:

1. Use for construction build

2. Use for holding position and withhold strong wind
3. Use for bridge joint foundation and crucial structure
4. Diagonal ties for this knot, seen as best result to tie and diagonal situations.

### 2.2.9 Square Lashing

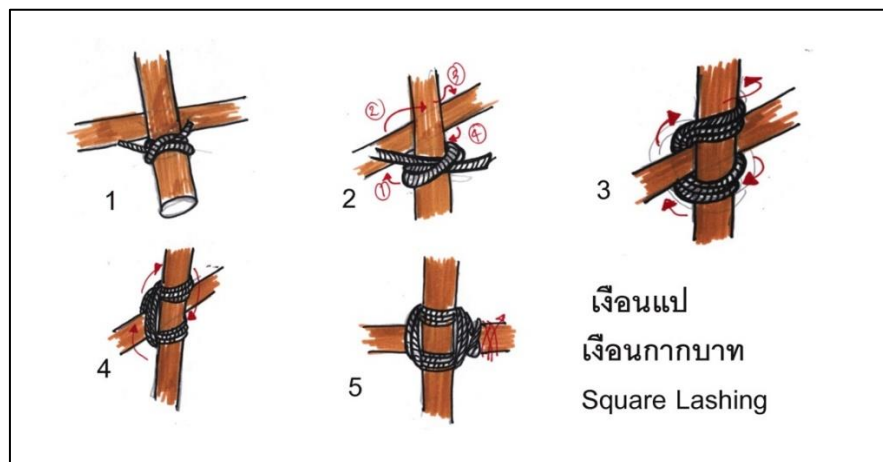


Figure 66 Square Lashing

Steps:

1 . Place wood or pole over each other in a cross-position figure, tie with hooked knot on the vertical piece, and bring the rope end and tie into the piece (marriage) image 1. Bring the rope insert under the horizontal piece from the left or right and pull up to bind around as loop with the vertical piece.

2. Pull rope toward the front loop around the horizontal piece then pull to the back the vertical piece from the right and pull, then with holding the pull, crossed over to the vertical piece to repeat the same tie direction as many times to fully secured. Each loop turn must hold and pull tight.



3. Aligned the rope in orderly manner, and rotate about 3 times and then tie dead knot 2-3 turns and insert the rope end to tie with a hooked knot on the vertical piece or the other piece not starting with tie.)

#### 2.2.10 Tourniquet Lashing

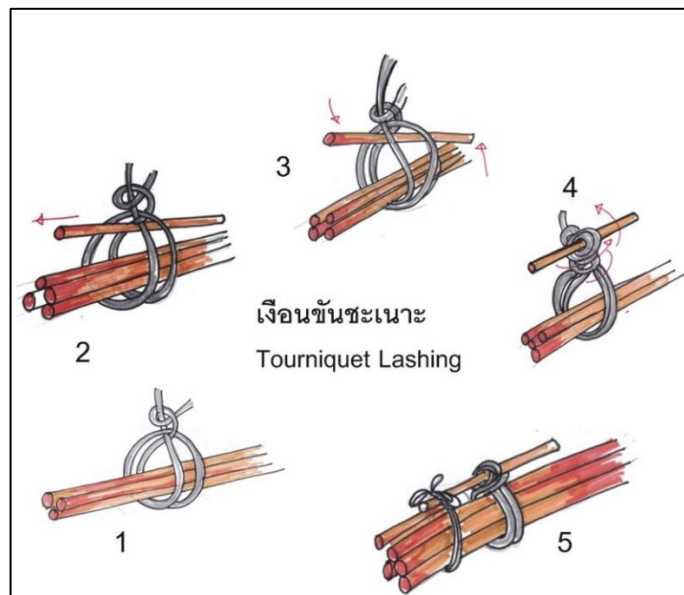


Figure 67 Tourniquet Lashing

Steps:

1. Place all wooden piece in squared angle as similar to crossed tie, made a loophole insert diagonally as image 1.

2. Chose a small twig, hardwood preferred, and insert into the loophole and turn the twig.

3. Turn the twig by tourniquet fashion into screw until tighten the object.

4. Continue turning the tourniquet as close to the object then use another small wooden twig and tighten as handle


benefits:





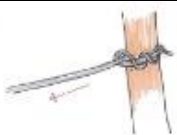

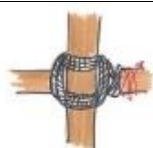

1. Use for building scaffolding: painting and construction
2. Use for constructing temporary shelter/ house.

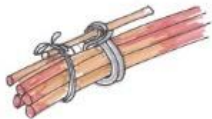
### 2.2.11 The Conclusion of Wisdom Knots

The process of tying knots categorized into 10 types of useful knots tying techniques. This research will employed these techniques as case studies, to investigate, observe, and learn, to examine and practice to engrain the nature of tying knots, which to transfer the study onto the creative process for design and decorative arts and interior architecture. In the notion of tying and binding, the focus on joints, structure of vertical and horizontal relations derived from nature of materials of rope through binding process and knot use. Whereas numerous binding and knots tied, that designated space will be more strengthen. The tying notion also representing a daily skill as employed to solve problem and assist in reconcile the inquiry, or creative process. Designing tool and handicrafts object, therefore will yield such a benefits to creating new products to answer an already known solution of a problem, only that this time we started from a closer proximity, from our own place, a village and local wisdom-full of newly rediscovery for creativity.

As a general daily life, housing technique is also benefited from the rope tying knowledge. Natural made structure from local resources with ability to tying techniques and thus explore the nature of materials that will discuss later on.

เงื่อน	รูป	ประโยชน์
พืรอด Reef/ Square		1 Shoelaces 2 Gift wrap 3 Rope Extension

ชาติสมาธิ Sheet Bend		1.Fishing net 2 Extending uneven rope 3.Tying to loop
ประมง Fisherman		1.Longer extension 2 Vertical ladder 3 Electrical wire connection
กระหวัดไม้ Two Haft Hitch		1.Pully use 2..Positioning pole 3.Swing and Lifting strength
ตะกรุดเปิด Sheet Bend		1.Pole and Position 2.Rope Ladder 3.Connector Construction Joint
ผูกซุง Timber Hatch		1.Power Pull 2.Structural Pull 3.Camping essentials
ประกอบ Sheer Lashing		1.House building 2.Fruit Scaffolding 3.Construction Framing
แป Square Lashing		1.Construction 2.Beam/ Joint support 3. Bridge foundation
แทยงมุม Diagonal		1.Joining pieces 2.Supportive Pole 3.Scaffolding foundation

ชั้นชะเนาะ Tourniquet Lashing		1.first-aid support 2.stop bleeding 3.build scaffoldings
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## 2.4 Material of kite knotting and tie process

### 2.4.1 Bamboo

Bamboo grown abundantly in the central region of the country. Climate influenced by storm and seasonal wind from the southwesterly in raining time, comprised of heavy rain and received cooler wind from northeastern region. Within this time expanse, there are 3 seasons, when summer from March to April with temperature average of around 33-35 degree Celsius, raining or monsoon season starting from May to November with yearly average rainfall of 926.4 millimeter, thus, winter began on December to February with lowest temperature around 18-25 degree Celsius. Classification of bamboo pertain characteristic as observed by the followings:

- 1 . Leaf with shape at the tip, stem, and stipules, which are different from species.
- 2 . Observing the length of internode such as Green, Stocked, Chinese, and Black bamboo, where wild bamboo in general has long stock.
- 3 . The size of the diameter like Long lean Six-sided, Tubular bamboo are unusual larger than other species.
- 4 . Observing the Bud, bamboo even pertain thorns above the bud: such as wild, Ripened, or Tubular bamboo.
- 5 . Coloration of Tubular or golden bamboo, maintain the same color for the whole plant, but with a stripe of green running for the entire length.

6 . The thickness of the plant like Ripened or Farmed bamboo can produce thicker stock than general bamboo.

From the observation, of the external physical appearance, other several information based on this kind of data may not justify what's needed about bamboo. As within the same species of bamboo, there might be sub categories due to the various factors influencing its growth. Even same species might not also appear the same if planted in a different location. Therefore, way to categorize correctly, must take trainings and full dedication to even learn about a part of bamboo (Agriculture Science: Classification, UNKNOW).

#### *2.4.1.1 Bamboo and human development*

Bamboo connection with human history on gatherings and hunting lifestyle has been a major part of human evolution, especially in adapting the life from existing natural, found, local resources. Because of its vast growing rate, its further project that bamboo and its elements can be the valuable support and trusted sources for humanity worldwide. As studied through the physicality and benefits, bamboo and the expansion of its content are helping human maintaining a balance in the local and broader economy. Thus, with low-cost investment or little since availability are locally found, helps made the small less dense community to develop design and creative solution to better fit the way of living.

Meanwhile during the increase of world population and decrease in natural resources, but bamboos are grown in the wild continuously. Likewise, human can project the growth of bamboo in kept captivity and able to learn and study its effective quality and impact to a community, of which it can serve us in variety of ways. At this level, classification of human community, social status, the haves and the haves-not are no longer the issue, Since, all can benefits from such materials both directly (as objects) and in-directly (green area and cleaner air), bamboo depicted the scale of evolution and

made it equal. In addition, from the traditional way of using bamboo, there are many alternatives through lower in prices and perhaps a way to take the load out of the choice of design that tends to favor plastic more than wood in the past few decades.

This section of the research will review ways to use bamboo through time and consider the special quality and connection with people in the community. It further investigates academic area, working places, as to how it is being perceived and raise further awareness for creative process and for the arts, and of a decorative idea.

#### 2.4.1.2 *Bamboo and human*

Evidence from archeology finding displayed that bamboo has been a part of human society at least 6000-7000 years ago. It also played a major role in economics and human cultural development, especially in region that sustains resourceful vegetation and plantation and viable natural material. Plenty of definition of bamboo has been transcribed through the year, some mentioned “wood of the poor, India”, “friends to the people, China”, and “Big Brother, Vietnam”. As been defined in aspect of environmental balance, which give bamboo the magnificent growing rate in vast area of Africa, Caribbean, and Latin America. Today, that reliable trust of this source, remain true, which use bamboo for food, fuel, shelter, furniture, agriculture tools, food vessels, water jug, handicrafts invention, hunting equipment, and musical instruments. Vegetation that holds many valuable tressure in culture and traditional practices globally, has still remain as bamboo, a symbol of strength, durability, and adaptability for all people.

Bamboo shoot is full of important protein and nutrients, popular as a favorite dish in Asia and drive the exporting of goods from China to Taiwan, to Japan, and to many other countries in southeast Asia. It is known that bamboo’s tip has been use for oven baked and prepared for many foods in Asia. It’s also a source of food for panda, elephant, and guineapig mouse as well.

Medical quality of bamboo is also known since the ancient time and has been recorded in Hindu' medical system ( 1 5 0 0 years before common era) in Chinese manuscript, literature in Latin America, where many other parts of bamboo is recorded to use as healing food, such as: roots, tip, shoots, even charred bamboo can also apply to light burned skin or bruises, and when prepare certain way can be used to heal and cure poison.

Continuous use of bamboo since the past until today, carried over to many aspects of life. Protective equipment, fishing tool, animal trap, seaman equipment and some community use to cut the new born umbilical cord or carried out circumcision for young boy. In Thailand, bamboo knife crafted to slice gold paper used to make offering and merit in the temple, while bamboo raft has been an important invention for water transportation, when burn for fuel bamboo gives out about 4,000-6,000 calories/ gram, which for a small kitchen has been long common practice.

Tradition of musical instrument made from bamboo in blown and string instruments in Thailand results in "Sor Ue", "Sor Dueang", "Ungkalung", and other strings instrument all have part made from bamboo. Flute making is a particular product, made up of monetary value with ranges from basic to exclusive design, even references from historical Epic and world cultural heritage has recorded in tradition of Hindu for Krissana, sacred and highly respected deity with flute as signify attribute.

Bamboo is also materials use for crafting process of household objects: baskets, lamp, furniture, and artwork. In China wickerwork made from bamboo dated back to stone age and reflect how wisdom and complex level of thinking existed in the past, proven the use of tool, and functional object made from bamboo played a role in their daily life.

Attention to evolution of crafts in history of mankind, with bamboo as the material was kept in record by Chinese humanitarian, which showed the respects of the materials. In other country in Asia, Japan, India, and the Philippines, definitely express

the affection for bamboo, for its quality and as the material to extend and propel many creative process, design idea and creation, to lift creative conditions in various aspect of arts, literature, music, illustration, painting, as well as an important component for compositional art and garden design.

The use of bamboo, reach the pinnacle in China before the industrial revolution in the west. Classic passage written by ancient Chinese on a bamboo plate and the invention of Chinese paper in the 9<sup>th</sup> Century was also made with bamboo. Thus, the Chinese company today, remain the forefront of art with bamboo in the business world.

In India, Rig Veda (1500 B.C.) meant art of archery, the high sport, made from bamboo that used on crafting the bow and arrows Arthasastra (The Art of State Craft) well known by Kautilya (322-298 B.C.E.) Prime Minister of Municipal Maurya King was also the first to announce the prosperity that bamboo brought to the region.

In Africa, the story is in similar fashion, of which bamboo is used for fuel, construction, and household objects, despite what has been recorded. Latin America and Africa shown the respect for the potential of economic and social community, even at the crucial period in their history, this material for as little possibility, help propelled the status with their exportation and usage within the country. Nonetheless, the development program of United Nation (UNDP), (UNIDO), (FAO), (ITTO), (IDRC ) and others international Network for Bamboo and Rattan (INBAR) in the past decade are becoming aware of the bamboo potential and the need to rejuvenate the market to withstand the acceptable cost and usage capacity.

In the west, there are mentioning of first bamboo siting through the letter from Alexander the Great to Aristotle (Pallini, the Elder, 23-79 C.E.). In the Western Natural History textbook, first used of bamboo recorded in 1880, when Thomas Edison used fiber strand in the light bulb. Around the same time, Institute of Forestation in India started to industrialize production commercially on bamboo paper, propel the production of paper and paper fiber, included neutralizer and color dye for viscin and



rayon to begin the development of country's industrial revolution (Freman Lui : Bamboo 2016).

#### 2.4.1.1 Type of Bamboo

For the case, sited for this section, bamboo found around Phetburee Province were sample from golden, stock, thin stock, yellow greenish bamboo, which are bamboo that support the fishing industry of the province.

(1) *Bambusa blumeana*



Figure 68. *Bambusa blumeana*

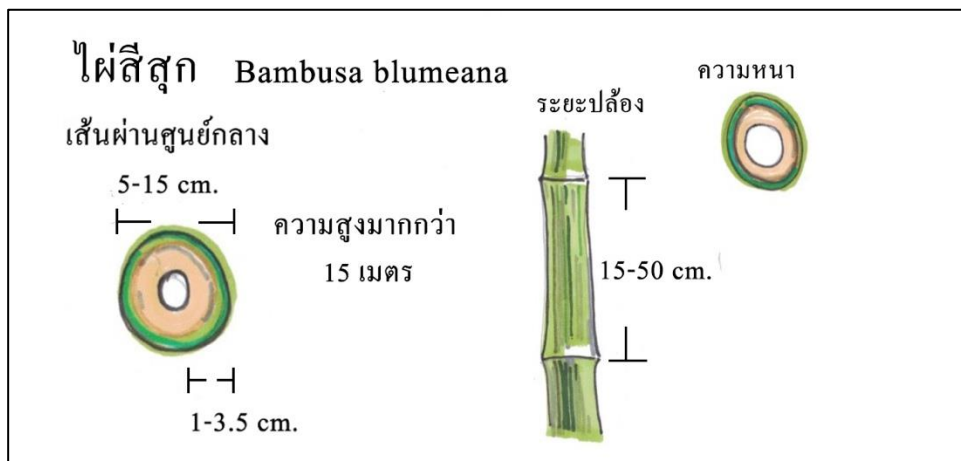


Figure 69. Characteristic of *Bambusa blumeana*

Spiny bamboo *Bambusa blumeana* in family Poaceae grow widely in southeast Asia, with height reaching around 10-18 meters and with diameter 8-12 cm. strong stock, smooth shell, none-swell, with branches spread horizontally, with curved thorn around set of 3. Middle stock is the longest, with tiny pores and about 5-6 leaves at the end of branch, leaf elongated oval shape, trunk a bit wide or grown straight. The leaf width of about 0.8-2 cm. and length 10-20 cm. Underneath the leaf shown greenish yellow tone, with 5-9 pair of leaf line, short leaf, coarse edges, with small needle, once flower every 30 years, shoot larger than other species with brownish fur covered. Wikipedia.

(2) *Dendrocalamus*



Figure 70. *Dendrocalamus*

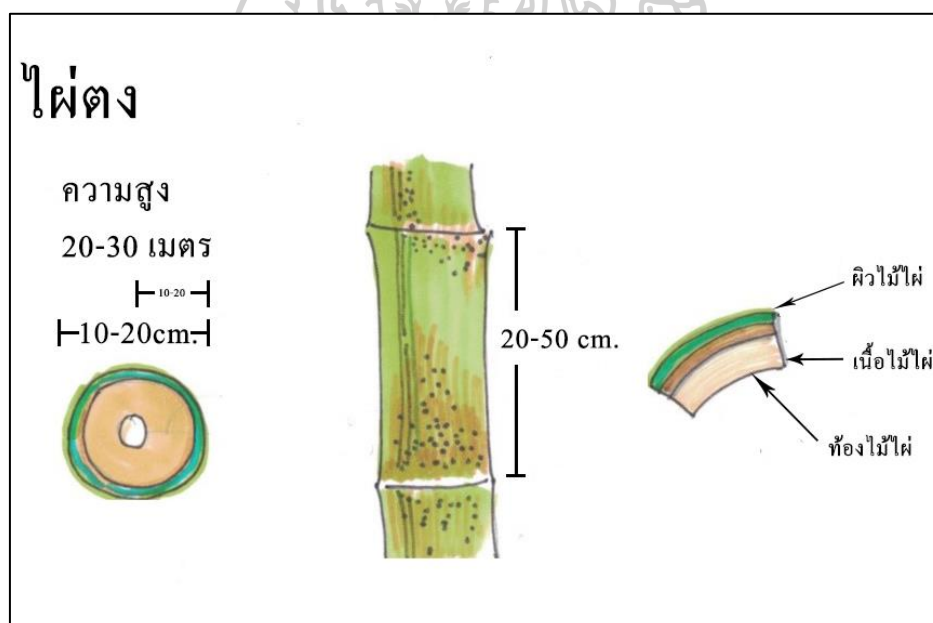


Figure 71. details: *Dendrocalamus*

Rough Giant Bamboo is type of large size family with height capable of reaching about 20–30 meters, straight stock and packed into clump, tip curve and slope downward with diameter of 10–20 centimeters bulb length 20–50 centimeters, thickness of 1–3.5 centimeters. Lower culm covered with thick brownish fur, upper culm omitted white and covered with grayish coat, culm with dark green and grayish

green, lower culm with thick furs and have aerial roots all over the shell. Branches low to the middle size, with about 3-5 branches, one dominant branch in the middle while the rest have average size and with aerial roots. Wikipedia

(3) *Thyrsostachys siamensis*



Figure 72 *Thyrsostachys siamensis*

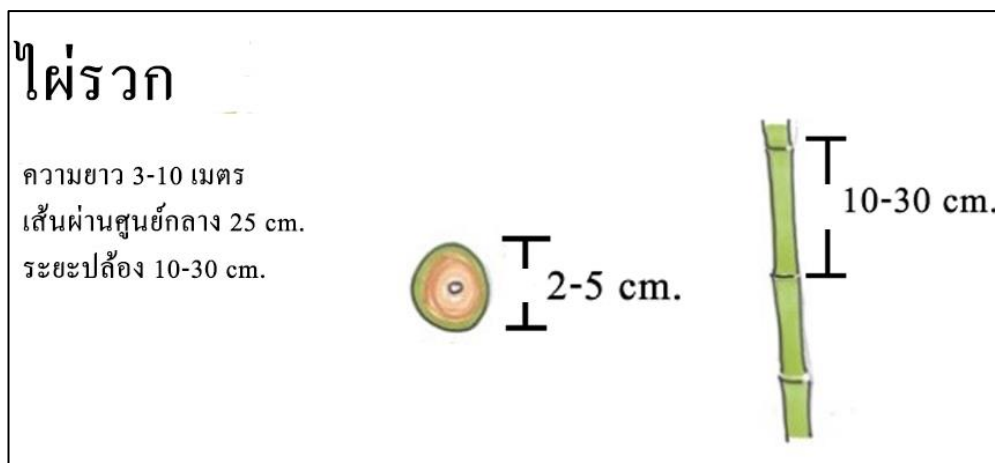


Figure 73 of *Thyrsostachys siamensis*

Umbrella Bamboo *Thyrsostachys siamensis* is a bamboo in small size, stock packed in stack, shell covering culm extremely stiff, shielded until old, grow and span in order, not branches at the end tip, two separate leaves, can withstand heatwave and grown wildly around the country. Most planted for fence line and protective from the wind. Discovered in country first, and name to honor the country. Also found in Yunnan, China, Myanmar, Laos, Vietnam, Sri Lanka, Bangladesh, and Malaysia.

(4) *Bambusa multiplex*



Figure 74. *Bambusa multiplex*

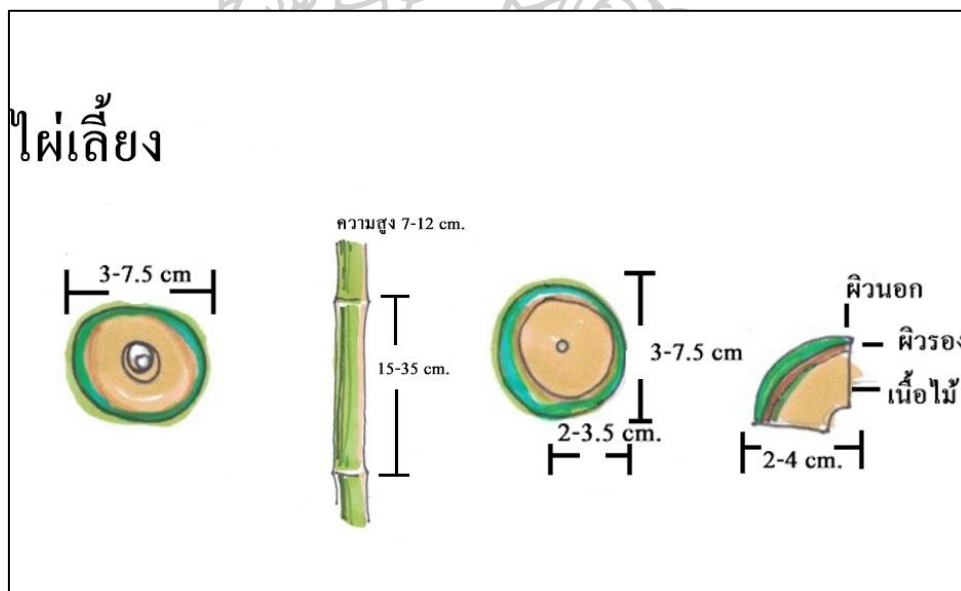


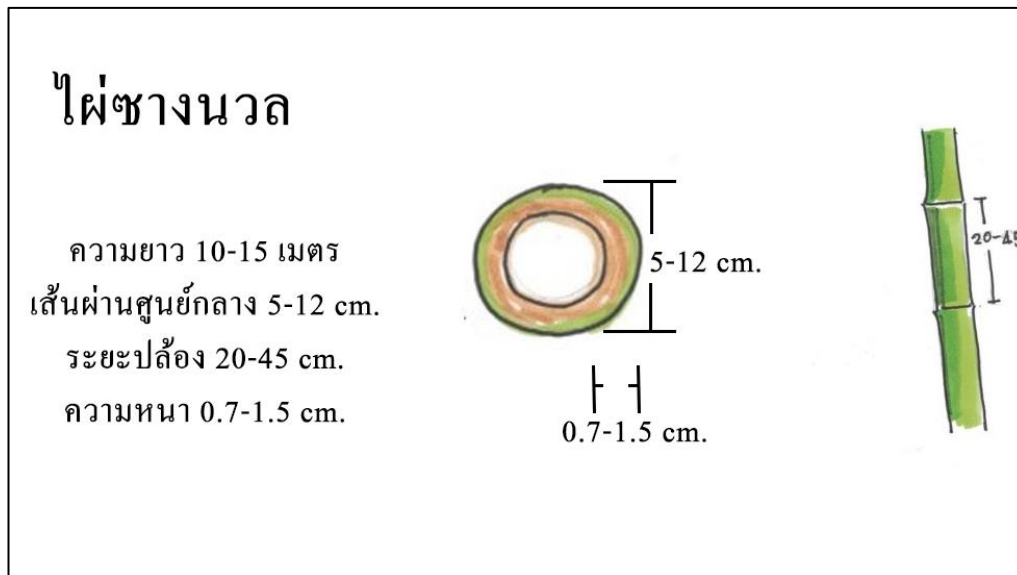
Figure 75 Detail of *Bambusa multiplex*

*Bambusa multiplex* forms as a medium sized clump with slender culms (stems) and dense foliage. This bamboo is suitable for hedges and live fences since the stems

and foliage form a dense growth that create an effective natural fence. The height of the stems under ideal conditions is about 3.5 meters. Propagation is through rhizome offsets and rooted culm (stem) cuttings. Micro propagation too is feasible through axillary bud proliferation. With its strong fiber, this bamboo is popular for making tools for various function tasks, and also use for pipe formation to slow down the current in Mangrove forest.

(5) *Dendrocalamus membranaceus* Munro



Figure 76. *Dendrocalamus membranaceus* MunroFigure 77 Detail of *Dendrocalamus membranaceus* Munro

This is a bamboo with height reaching at least of 10-25 meters. straight stock 5-15 centimeters culm length 20-50 centimeters thickness of 0.5-2 centimeters. Color of culm is light with powder covered on shell. Older culm has light green, bottom culm without fur. Branching grow throughout the whole tree, Third branch is the dominant with mid-size grow in the middle and two others branch to the side. Leaf small and elongated, similar to blade width of 1-2 centimeters length of 10-20 centimeters. Shell protected the shoot has brownish fur overall but may be more at the back of leaf. Shoot is edible but not popular. This bamboo is best use of its culm most in the country. Usually selected for building scaffolding, for wickerwork, for laminated sheets, or marker for sea pole, The most use is for making chopstick, street food sticks, toothpick. It tends to grow wildly and farm in northern part of the country: Chiangmai, Phrae, Payao, Lumpang, Chiangrai, Nan, and Uttaradit. There are mainly cut from nature and with research how to grow in area of Nan, but eventually took 7 years before can cut. Many branches and difficult to maintain and growth rate not predictable. There should be a work that kept the decent pack and keep regenerating when it is time.



### 2.4.2 Paper



*Figure 78 paper*

Paper is a material produce into object use for taking notes. Long history believe that the use of paper started with the Egyptian and ancient Chinese, but paper in the beginning produced to solely for note taking. It is an assumption that the inspired process behind making paper since there are more use of it around the globe Today, the purpose of paper went beyond its prior predecessor as toilet paper, gift wrapping paper, or corrugated paper for packages.

As mention, ancient Egyptian with paper or papyrus paper made from Papyrus from the river Nile, of which numerous manuscripts in literature, faith prayer, and placed inside a pyramid. Historian believes that paper made from papyrus as he beginning of early bloodline. (approx.. 3,000 B. C.E. before common Era.)

For materials in writing in the ancient time, made of several materials : such as metal sheet, stone, vegetation, or silk. There is possibility that people of the ancient time use paper for learning, recording new knowledge, and entertainment. Until 105 C.E., during the reign of Emperor Hoti, the Chinese have invented paper within villagers named Ts'ai'Lung, who used bark and fishing net and boiled until thin fiber extracted and ready to dry on rack, Thus become the way produced paper ever since.

Paper was brought over from China then brought to the Islamic world after the war of Talus in 751, B.C.E, where the navy fought against the Islamic naval forces, captured two prisoners of wars. They have reveal the secret of paper making to the Islamic before being released. From that point on, paper creation for them is longer just an art form but became a manufacturing process. That brought the Islamic educational realm into a wider scope, making the civilization rich and prosper with in the art culture around the world till today.

Islamic artist and inventor developed ways to improve the paper making, by using linen in place of mulberry as what have the Chinese has accomplished. Linen has a quality of moisture absorption, decent air circulation, does not repel water, and soaked water well. When boiled can be well cleaned, clear of residuals, then the damped fabric will be beaten into fiber sheet and placed to the artist to bring it to life through creative art and crafts.

Bagdad the jewel city during the Kingdom of Akbar at that time were full of paper manufacturing scene and business that then spread out through trading route around the world. Paper delivered to Europe, for the most part, were made from Damascus (Syria), and as production and trade expand, the cost of paper is lower with better quality that distribute worldwide.

From there many well-known paper manufactures erected in Iraq, Syria, and Palestine and expanded toward the west. In Africa, the first paper manufacturing established in Egypt around 850 C.E., and then announced the firm link to Andalucia in the Islamic empire of Spain.

Paper also first produced in Europe by the Moorish. Made with best quality of jute from Valencia, center of the main manufacturing quarter in Xativa or Jativa near Valencia with direct tie from Spain and Sicily Island, which at that time belonged to Islamic Empire. There on, paper expanded to Christianity in Italy and in 1293 an official

establishment paper factory in Bologna. Then in 1309, paper used appeared in the rest of Europe, where England and later at the end of 14<sup>th</sup> Century in Germany.

### Paper in Thailand

Historical fact from the paper popularity in Siam was not clearly recorded, but material that appeared like paper was termed “Thai-Book” or “Samut-Thai” that produced from boil stock and beaten to thin fiber sheet with added flour for additional contact surface. Then brought on to the filter tray and let dried. Peeled into thin paper sheet and folded to the intended page length- be ready for use when the process is completed. It was known as “white book” or “SamutKhao”, and if a preferable in darker color “black book” or “SamutDum”, which charcoal will be added in the process. In the northern Thailand, there’s a similar production process called “Rice Paper” or “KradarhSa”, when used as a book it was also known as “PumpSa”. The word paper in Thai presumed to come from an Arabic and Persian word “kridors”, during the time of Persian trades in Ayutthaya Dynasty, where in Malay’s language has similar word for paper as “kertas” as well. As far as the word “kridors” used in Arabic, but even before 6<sup>th</sup> Century may be a word that borrowed from the Greek from the word “khartes”, which in modern day English it is similar to the words: chart, card, and charter. Furthermore, there’s an additional word from Portuguese “cartas” in a plural form of “carta”, which means letter, or map; that estimated of the Portuguese who brought the use of paper before the Ayutthaya Dynasty.

Paper in the modern era have seen as a waste, the process of reusing of paper such newspaper folded into paper bag, using both side of the office’s paper, or recycle to produce braille reading materials. Office paper in Thailand has a certain standard size A4 and weight 70-80 grams at most. Once it comes to the end of life cycle, paper can still be recycled into carton boxes to save the material in unsanitary waste dump.

### 2.4.3 Rope

Rope has been the oldest invention to mankind, used in many cultures since stone age around 10,000 years ago. It was discovered to change how human live and conduct the day-to-day basis: such as fishing net, gathering honey, and use in construction. Rope was made first as a short length, then when used the action of twisting and turning upon it, has made into a braid, which later added with mixture of hemp fibers, or Papyrus silk. In the process production sometime later, rope was developed to increase in longer length for purpose of transporting large cargo or objects or even for expedition with mountain climbing. In the year 1950 -1960, the discovery of nylon and other synthetic fibers, help propel the idea of bringing such material and added mixture for rope making process. From there on, however, natural fiber rope was still in demand and continue its life despite the higher demand of nylon rope (Mongkolrattanasith, online, 2016).

Current encyclopedia stated that rope is made from hemp, spun to twist for tying and binding objects. Kam Witaya (vol. 9, 1997), mentioned that rope is a fibrous raw material, bind to twist with various size, which increase in strength when applied by pulling force and commonly bind to the right and define into 2 types: 1. Natural fiber from plants like hemp, jute, papyrus grass that when wet is hard to unbind, and 2. Synthetic material with chemical process for better quality. Rope that made from natural fibers are lighter in weight, lower in cost, and have more variety to select, as well as withhold water resistant where synthetic through time will dissolve from use and high heat climate.

Worapot Srisangachai (vol 13, 2010) mentioned that rope is object made from thread or fiber, bring to splice and twist into one strand to create strength in order to bring for use in tying. Usually twist to the right. Rope has two types, which are of natural fiber, and other of the synthetic production process. Also rope that made from synthetic process hold a better quality than one that made from a natural process, whether in weight, lower price, and many kinds to choose from vast collections.

Prakit Chaitorporm (vol 15, 1998) mentioned of rope as raw fibrous material that bring to tightly turned until twisted, which made the rope stronger as fully pull during the twist. Rope turning usually rotate from the right clockwise direction. Categorized as well to two types: 1. Natural fiber rope, that used vegetation like hemp, jute, papyrus grass, thus usually held problem when wet, which made the rope hard to tie. 2. Synthetic fiber, that discover from the chemical invention, where it has better quality than natural fiber rope in lighter weight, lower in price, and broader spectrum of type to select. In addition, it is not prone to water, having more flexibility, and higher durability from natural fiber rope.

From the definition as mentioned, assumption of the rope as a raw material fiber that bring to spin or splice then twist into single rope strand, where this process gives the rope strenuous quality for use as tying technique. Two type of rope are as follow:

1) Natural Fiber Rope

Majority of this type of rope made from plants, but consist of quality such as prone to water that made it difficult to tie. Also rope made from Hemp yellow in color, with coarse texture but brittle when prolong use and not suitable for work with water or extreme wet condition. Solving this, is to wet this rope with oil for protective coating to prolong the use.



*Figure 79. Natural fiber Rope*

Manila rope made from manila plant, abundance in the Philippine, usually white in color, but flexible and easy to tie many types of knots. This rope also holds heavy stretch load more than hemp rope, popular use is in construction as tying pully, for expedition, and best when use in dry climate, of which can break when working in wet condition.

Coconut coir rope made from coconut coir, light in weight, floatable, made it suitable for work in water, as its quality is to repel water. Popular use for harbor duty and all marine tying tasks, but pertain lesser holding strength than the manila rope of the same size.

Jute rope made from jute plant, when left without use might be spoil by insects such as: moth and termite attack. Best for temporary on land usages, such as: for tying tourniquet knot or building a scaffolding. This rope is made from raw spun fiber so it is white in color, soft texture, easy to roll, often does not get tangled, and use for household chores without strong sunlight.

Candle-wax cotton rope is made from cotton and coated with candle-wax, strong strand in general with special quality of fire-retardant property, and also popular for woven into jewelry.

## 2) Synthetic Rope



*Figure 80 Synthetic Rope in various color and length*

This type of rope is the in-direct success from chemical industry, with better quality as lighter in weight, durable, and lower in price. However, when in contact with heat or prolong sunlight, the rope becomes brittle and break apart easily.

Nylon rope is made from synthetic substances, durable, flexible and pertain high tensile strength more than other kind. Maybe difficult to tie, because it recoils easily, and with constant strains, the rope may not last long, suitable for marine or water situation, and cautiously stay away from heat or opened fire.

Cable Rope has a characteristic of rope that made from nonferrous metal with coated tungsten, machine spun into twisted tie. Has a heavy gross weight but hold high power strength at higher price and not easily rust. Suitable for constructions, such as: structural foundation, telecommunication pole, or observation deck tower.

Knots and related materials technique will be use as part of the knowledge base revisit. The information gathered from all notion of materials will put forward with the design process. Particularly, the tying techniques, which is the foundation approaches, such like tying, binding, and pulling, are all suitable for generating creative idea for the research. Using rope, bamboo in harmony will enhance the binding become stronger in many aesthetic and functional essence. The local wisdom and handicraft skills: kite making process that employed many way of using knots with rope, bamboo, paper, fishing net, and furniture making, to be an inspirational idea for arts and decorative process for household products as well.

## 2.5 Folk Aesthetic

From the observation of researcher folk aesthetic divided into two type firstly, the beauty from natural and environment. Secondly, the beauty from living context.

### 2.5.1 Natural and Environmental

Kite tradition is merely the reflection of its true cultural identity, which create by such local materials worthy of a representation of cultural identity.

### 2.5.2 Living Context

Crafts is a tool a functional object, which created from mainly hands: sculpt, carve, woven, which came from the hands of artisan/s. Folk, a humanitarian scholar defines the word to represent one group of identity or characteristic of one or any others, may appear to be a form of similar survival idea, using the same language and religion, with similar traditional beliefs.



## 2.6 Contemporary Arts and Design for Creative Economy

### 2.6.1 Creative Craft

Local wisdom may seem to be a chase of the prosperous time. Handicrafts may become the higher status gimmick that resonate the preferences of taste, of intention, or of thirst to push and not only to raise a sense of awareness but to revive and sustain the “what if”. Today craft design demonstrated how the hands work and created the desirable response from the need of its people. Made by hands but work by trends seem to have a survival mode epitome. However, the consumers judge and knew what's best, what's not to follow. As the new market opened to international and building creative energy to all people, the world of crafts may stand a great chance of survival. How to justify the design of local wisdom movement, is it a movement or a time pacify to keep calm on waits for the creative to happen. The time is nothing but now, the present is what matter, and together with skills and wisdom, since there's light at the end of tunnel after all.

Contemporary art and design today or art and design of modern time, including artists and designers that concentrated from influence of sustainability, social impact, cultural indication that deals with social, community, culture, nationality, international, environment, and all other problems, news and lifestyle that reflect in objective output, that also includes creative design, material alternatives that always the mirror of our mind/soul related to creative arts.

### 2.6.2 The opportunity of contemporary arts and design

1. The benefit and method that related to current use of idea to continues must be easy to communicate and with objective solution.

2. Aesthetic is capable of control only when the original idea serves the beauty to decorate or to invent for exceptional condition, with accessibility to all of its aspect.

3 . Product Quality where design hold the high quality with material worthy of discovery in the current time.

4 . Initial price value and investment must reflect order and procedure on knowledge and understanding of the work cycle, not too high, not too low, only the suitable.

5 . Safety during use, protecting the creation reputation without harming nor punishing the creativity with toxicity.

6. Maintenance with ease and secure for safety from undesirable elements.

7 .Services personify positive mentality without extravagance use of material resources.

8. Creativity reflects through the quality within the idea and the design not only show the aesthetic but genuinely the care, with thought process, with execution, with ability to adapt and allow for space to constantly grow to develop a balance of positivity.

9 . Exhibition has hold the importance of all has mentioned, where the expression of pure energy in the view of the publics, which generates the trust of the design as a whole.

Handicrafts created for functional purpose within the power of the handmade processes. However, traditional handicraft possess beauty within itself, perhaps it is the shape, the pattern, the color, the details, and skillful of material manipulation. Therefore, handicrafts indigenous or regional can considered as traditional handicrafts, as a definitive term given that if material has been treated with utmost intention to create beauty more than function, that creation can be creative-crafts but if attention to function is over beauty than it is handicrafts.

## Chapter 3

### RESEARCH METHODOLOGY AND DESIGN PROCESS

#### 3.1 Research Methodology

As the result of this research has a major objective that needs to provide a context of Thai craft and folk arts, wisdom of knots and tie. The research was used mixed methods research approach is a research approach whereby researchers collect and analyze both qualitative data and practice led research method within the same study. To understand the process of design demonstration, to clarify the relationship between handicrafts to contemporary designs. Then used knowledge for develop the techniques of knots and ties style in creative design product and furniture design as a research to promote handicrafts in the Thai local community which is fishery and tie in fishermen's village, Bann Lam District, Phetchaburi.

This research has its main objective to provide contextual understanding of Thai craft and folk arts, specifically attempting to understand wisdom of Thai knots and tie. The research utilizes mixed research methodologies and approaches that allow researchers to collect and analyze both qualitative and practice-led research method within the same study to comprehend the demonstration of process design as well as to clarify relationship between handicrafts to contemporary designs. As a result of this study, knowledge gained can be utilized for development of the techniques and style of knots and ties for creative design product and furniture design. The case study looks at the Thai local community, Bann Lam District in Phetchaburi which is fishermen's village to gain local insights.

This research intent to use mixed research methods where as to answer research questions that other methodologies uncovering process. Also, provides better stronger inferences this approach an

This research intends to utilize mixed research methodologies to tackle research questions rather than fixing with one particular methodology for in responding process.

### 3.2 Mixed Research Methodology Approach

#### 3.2.1 Qualitative Research Methods

This approach suits the objective of the research, which wishes to gather information the ways which people utilize digital objects in relation to their behavior, and activities within a particular context. Qualitative research tool helps researcher to engage with the target audience in an open-ended, exploratory discussion by using tools like focus groups, observation and in-depth interviews. Qualitative research is based on the conventional way on asking the question of “what, why and how” and provides directional data about the target audience. It is commonly used to explore perceptions and values that influence behavior, identify unmet needs, understand how people perceive a marketing message or ad, or to inform a subsequent phase of quantitative research.

Although the qualitative approach provides a sound basis for research, Contextual Design utilizes variety of methods depending on the information required, however, preferable methodology is a combination of background interviews and in situation observation.

#### 3.2.2 Practice-Led Research Methods

Practice-led or Practice-based research methods are working way in which utilizes practices in pursuit of the new set of knowledge in that particular discipline. This can be included the outcome knowledge from the study procedure or creation that conveys the originality of the work or development of creative knowledge or if it

contributes to the new research knowledge, it can then be considered and Practice-led Research. This can be considered as the new way of research in the study of arts the process or procedure of study or conducting of research in itself represents as the way of study synthesizing new academic knowledge contributing academic realm and wider public. Practice-led Research has its strengths in being interdisciplinary research/academic methodology which is can be considered as a creative method in response to current situation and inspiration. In addition, it focuses on the real life experiences that occur unexpectedly during artists' working process which will not allow artists to expect how the ultimate results of the research piece will look like until it is complete during the creation process. Given this assumption, patterns and system in conducting research are recommended to be designed with flexibility and adaptable that can be changed in each research stage. Although the research methodology is free, open to creativity, not constrained with formal techniques, various in its way to present that align with nature of contemporary artwork, the body of knowledge that serves as the ultimate goal of all research work needs to be standardized in line with expectation with referencing, background study and analyses, as well as verification and validations of data for the benefits of future study.

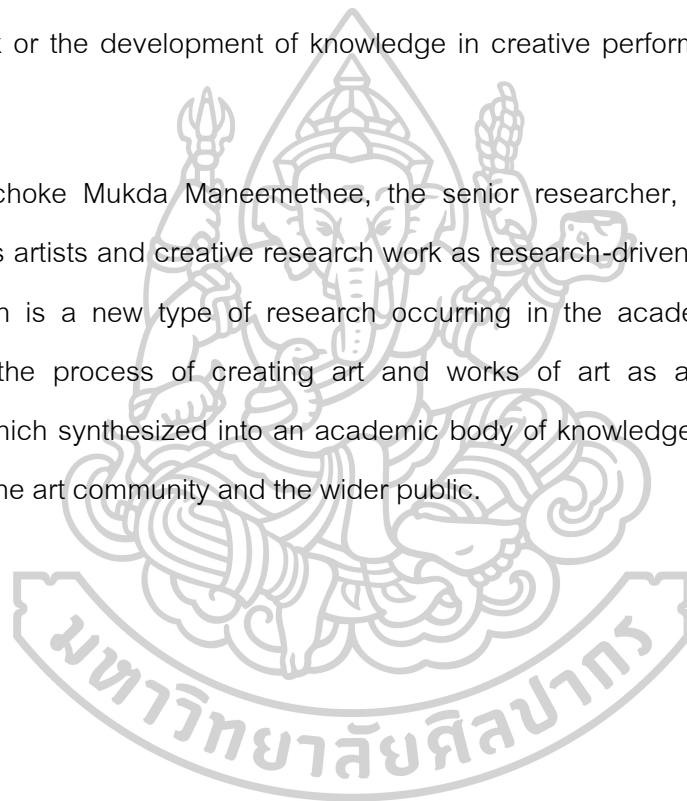
The creative work that uses research in the pursuit of knowledge can be divided into two main categories(Candy, 2006b). Firstly, creativity based on research (Practice-based Research). Secondly, Practice-led Research is research that leads to knowledge of a new understanding of creativity.

The differences between the two research genres, can be concluded that practice-based research is a research that creates new knowledge by practicing and come up an understanding as a result of that practice. The research work will demonstrate through the results of creativity in various design styles such as music, digital media, and performance. On the other hand, Practice-led Research, focus and context are explained in a naturally-written style that leads to the new body of knowledge. Practice-led research, also focuses on the design and production process,

and the design results of the research will be explanatory by writing without the need for a creative piece of work. Notably, this research style's focus is the advanced knowledge of the design practice, including the existing in that practice Processes and practices play a vital role in completing Research (Candy, 2006).

Preecha Taothong, a national artist, also mentions that Practice-led and Practice-Based Research are defined as creative work by providing practice as a tool to lead to new knowledge in the field. That is expressed by the uniqueness of the creative design work or the development of knowledge in creative performance in a particular field.

Wichoke Mukda Maneemethee, the senior researcher, defines Practice-led Research as artists and creative research work as research-driven, hands-on. Practice-led research is a new type of research occurring in the academic field of art. By presenting the process of creating art and works of art as an essential learning resource, which synthesized into an academic body of knowledge. This research style will benefit the art community and the wider public.



3.3 Design Process

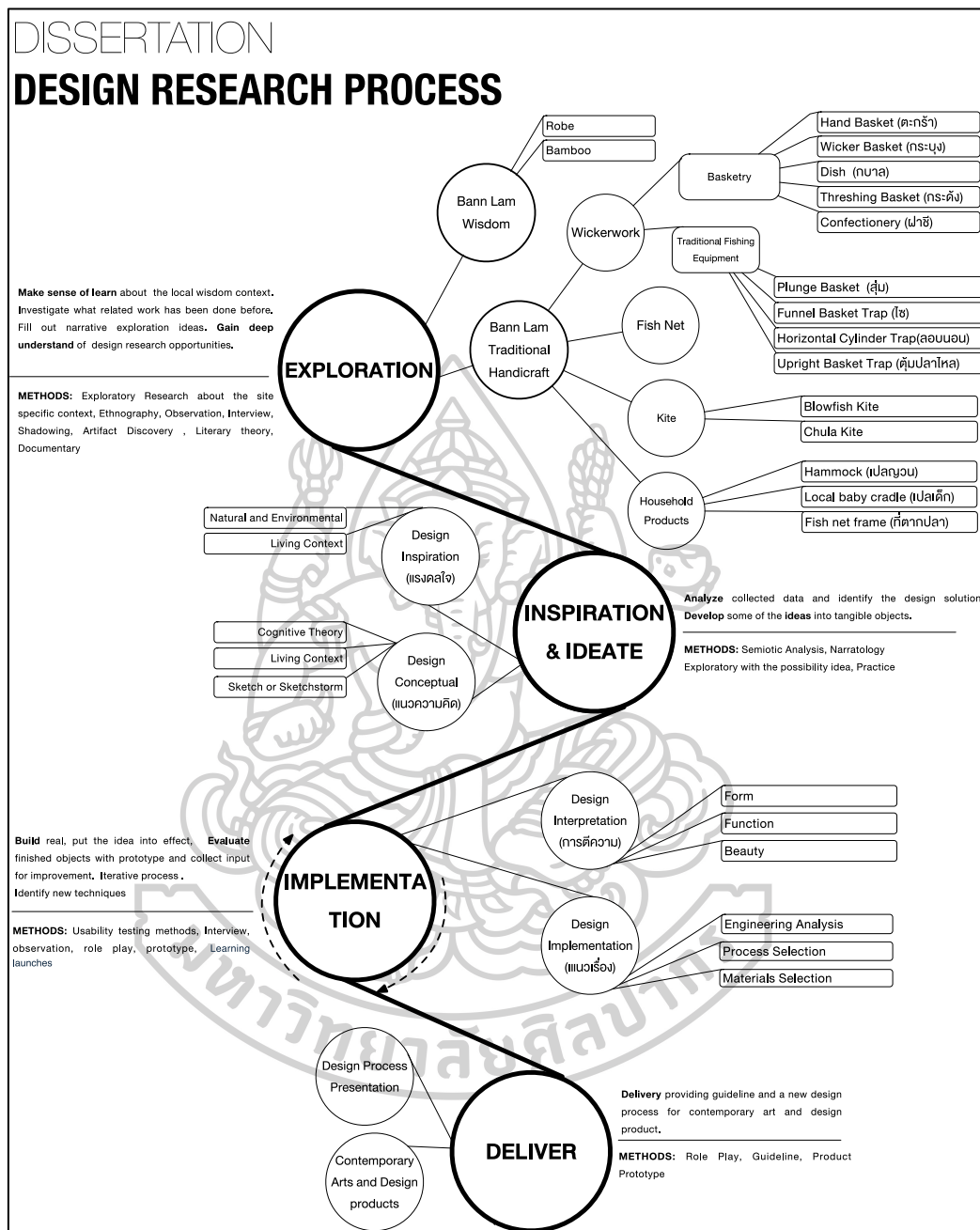


Figure 81 Dissertation Design Research Process

This research design process of this research can be divided into 4 major stages: Exploration, Inspiration & Ideate, Implementation and Delivery respectively.

To tackle the real research problem and figure out the feasibility of the design approach, the researcher begins the design process from Exploration, whose objective is to rationalize learning of the local wisdom context through investigation on what related pieces of work have been done before. This contributes to fill out of narrative exploration ideas and gain a deep understanding of design research opportunities. The methods that are used in this stage include exploratory research through the site-specific context, ethnography, observation, interview, shadowing, artifact discovery, literary theory, documentary. To sum up, the exploration stage aims to develop concepts more clearly, establishes priorities, develops operational definitions, and improves the final research design. Moreover, there is a need to study new phenomena or situations. Exploration is often, however, given less attention than it deserves.

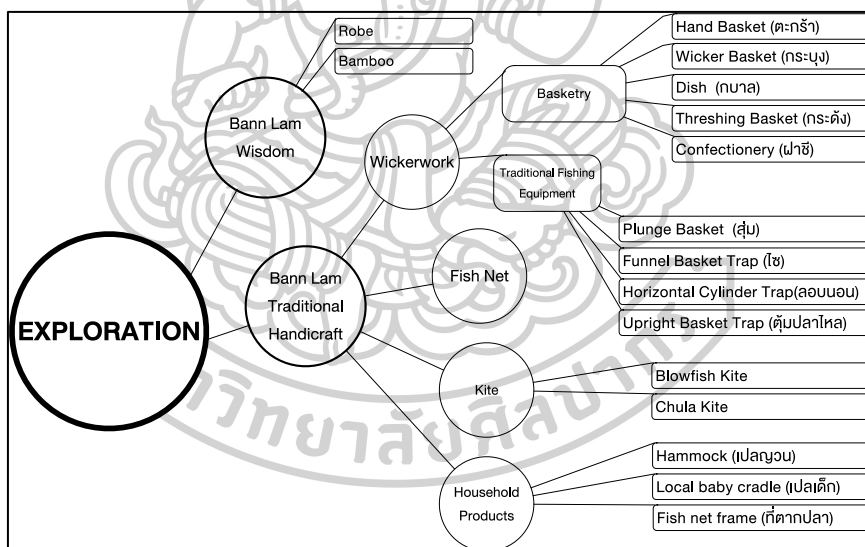


Figure 82 Exploration Phase



### 3.2.1 The first phase (1<sup>st</sup> phase): Exploration

The exploratory phase- search strategy usually comprises such as discovery analysis of secondary sources. such as; published studies, analysis of documentation, and retrieval of information from organizations' databases, as well as expert interviews with those knowledgeable persons regarding the problem or possibility of the purpose to encourage participants to discuss extensively, to share as much information as possible. Moreover, this phase focuses on the context of Bann Lam Wisdom and Bann Lam Traditional Handicraft. The result of the exploration phase will contribute to underpin learning about the local wisdom context by investigating related work that has been done before contributing to fulfill narrative exploration of ideas, and **gaining deep understand** of design research opportunities.

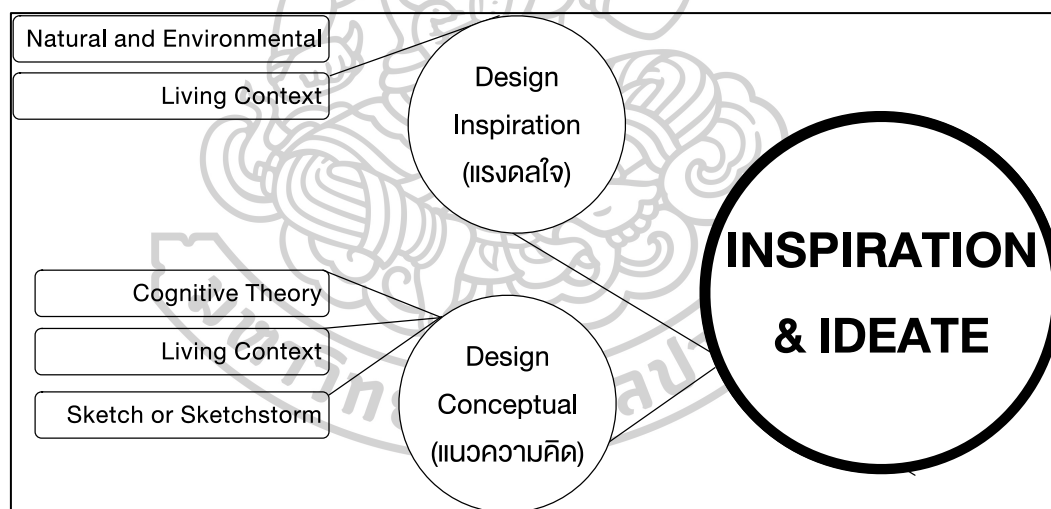


Figure 83 Inspiration & Ideate Phase

### 3.2.2 Second Phase (2<sup>nd</sup> phase): Inspiration and Ideate

The second phase is considered particularly important to the conduct of this research which is called inspiration phase. This is the process set up to gather and measure information on variables of interest, in an established systematic fashion that

enables one to answer stated research questions, test hypotheses, and evaluate outcomes. The data collection component of this research is common to fields of study including physical and social sciences, humanities, business by using Service Design. While methodologies vary by discipline, the emphasis on ensuring accurate and honest collection remains the same.

Sources of inspirations referring to problematization of thoughts can be useful for researchers in hypothesizing the research topic and understanding its significance which can be served as sources of reference. This will help define the research boundary that will as a consequence come up with the philosophical explanation of this research.

The researcher categorizes processes in finding inspirations in two patterns, namely, inspiration driven by surrounding and nature and inspiration driven by living and context that we can observe on a daily basis. This will induce ideas that results in design and creation of the modern pieces of work.

The theoretical framework of Cognitive Theory refers to focus in thinking process. Thinkers in this school of thoughts extend thinking boundary from looking at behavior to thinking process that starts from inside brain. Therefore, this group perceives that learning process of human does not only refer to the responsive mechanisms to stimuli only but rather is more complex. The learning process is the continuous process of information gathering, construction of meaning, and extraction of data and information to respond and solve problems. Learning is thus human's intellectual learning process in pursuit of new knowledge and for self-understanding.

Key theoretical frameworks of Cognitive theory include;

1. Gestalt Theory of Max Wertheimer, Wolfgang Kohler, and Kurt Koffka
2. Sign Theory of Tolman
3. Theory of Piagte and Bruner

#### 4. A Theory of Meaningful Verbal Learning of Ausubel

5. used to be member of Gestalt Theory and later became independent from the school of thought

#### 6. Cognitive Flexibility Theory

#### 7. Schema Theory of Rumelhart and Ortony

Cognitive theorist pays particular attention to the cognitive and reasoning process of learner that is different from behavioral theorist that emphasizes observation and ignore cognitive and intellectual process of human that is based on cognitive school of thoughts as they consider thus intangible. In other words, the scientific process relies heavily on the correlation between exogenous stimuli (from different sources of media) and endogenous stimuli which is knowledge and understanding or cognitive learning process, such as;

1. Attending
2. Perception
3. Remembering
4. Reasoning
5. Imagining
6. Anticipating
7. Decision
8. Problem-Solving
9. Classifying

10. Interpreting

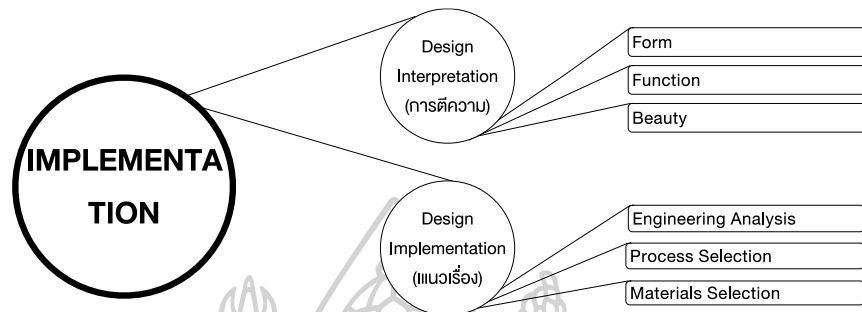
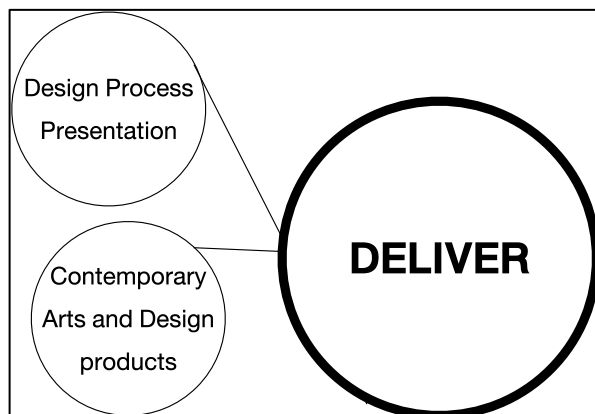


Figure 84 Implementation Process

3.2.3 Third Phase (3<sup>rd</sup> phase): Implementation phase

The purpose is to **analyze** collected data and identify the design solution and **develop** some of the **ideas** into tangible objects in order to symbolic patterns. The symbolic pattern will be utilized as a techniques way to depict and indicate systematically. Idea in developing of selected patterns will have to provide complete sets of details, therefore, the researcher utilizes “Engineering Analysis” by considering the scenario by repetition as well as conduct test based on materials science knowledge to define appropriate materials to create modern creative products.



*Figure 85 Deliver Phase*

### 3.2.4 Fourth Phase (4<sup>th</sup> phase): Deliver phase.

Delivery provides guideline and a new design process for contemporary art and design product.

Belonging to the four phase, this paper insinuates into Research Methodology Approach following the IDEO (IDEO, 2015). Design thinking is a human-centered approach to innovation that draws from the designer's toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success. Thinking like a designer can transform the way develop products, services, processes, and strategy. This approach brings together what is desirable from a human point of view with what is technologically feasible and economically viable. It also allows people who aren't trained as designers to use creative tools to address a vast range of challenges. All the 4 steps of Design Thinking Process Approach of this paper will explain below.

### 3.4 Conceptual Analysis

In designing products as well as ideate creative work, looking at surrounding environment, such as; living things and objects can create and develop learning skills mixed with different patterns and tie can be sources for creative work and design. Creation of work from bundling rope with bamboos, making of kites, making of fishing nets, basketry, furniture can be greatly enhanced through aforementioned techniques. This research studies skills and practices that contribute to the development of experiences to become mastery of such practices. This includes further application and development for techniques results in creation in 3 groups.

### 3.4.1 Hanging lamps inspired by roses

#### Introduction and Inspiration

Ideation and creation of hanging lamp products inspired by roses which consist of layers of roses' leaf petals giving dimension and beautiful. Researcher, therefore, applies this pattern for conceptual design of the hanging lamp which makes it look natural by using different techniques, such as; tying, hooking, simple turn and two half hitches to produce dimmed illuminating lamp for decoration purpose.



Figure 86 Roses patterns and hanging lamp inspired by roses

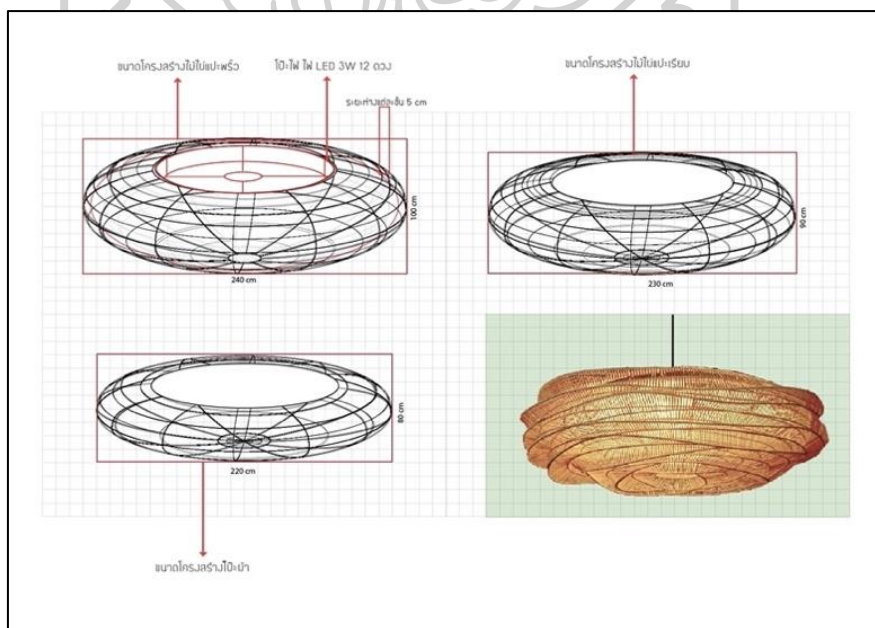


Figure 87 Sketch Design of hanging lamps inspired by roses

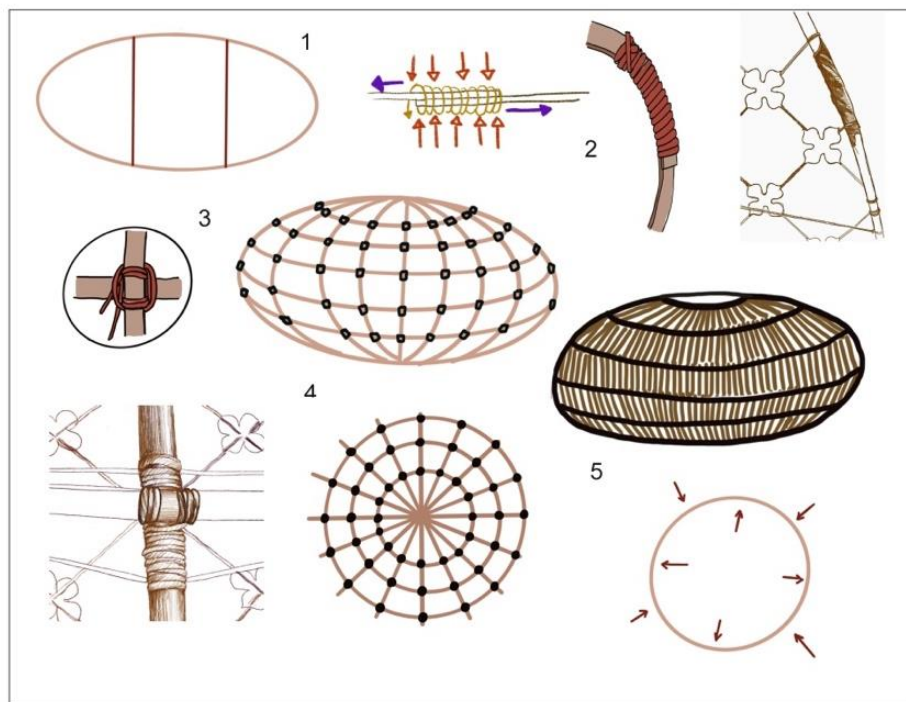


Figure 88 The application of the Ties and Knots: Internal structure formed up by bamboo

Techniques to form ellipse pattern is made by sharpening ripen bamboos and bundle it with sheer lashing techniques that is used to extend the wing of the Chula kite. Bundling bamboos with these techniques does not require special wood connecting techniques. The sequence in bundling is as follows.

1. Internal structuring of lamp is functionally designed with complexity which is attached with glue. Each tying spot is glued to create sticky nature contributing to strong attachment. The pattern and formation with circle and ellipse forms create bundling connection of ropes vertical and horizontal lines which create tensile strength resulting in strong physical strength of lamp.

2. Connection of wood sticks are adapted from bundling or tying to attachment with Cleve hitch and left with approximately 3 cm. to create strong ellipse form.
3. Bundling between circle and ellipse lines in the vertical direction will create and ellipse form.
4. Internal structure line will be circle and ellipse.
5. Designing patterns by attaching with bamboos makes structure batten of woods with the gaps that allow light through serving as the first layer of the structure.
- 6.

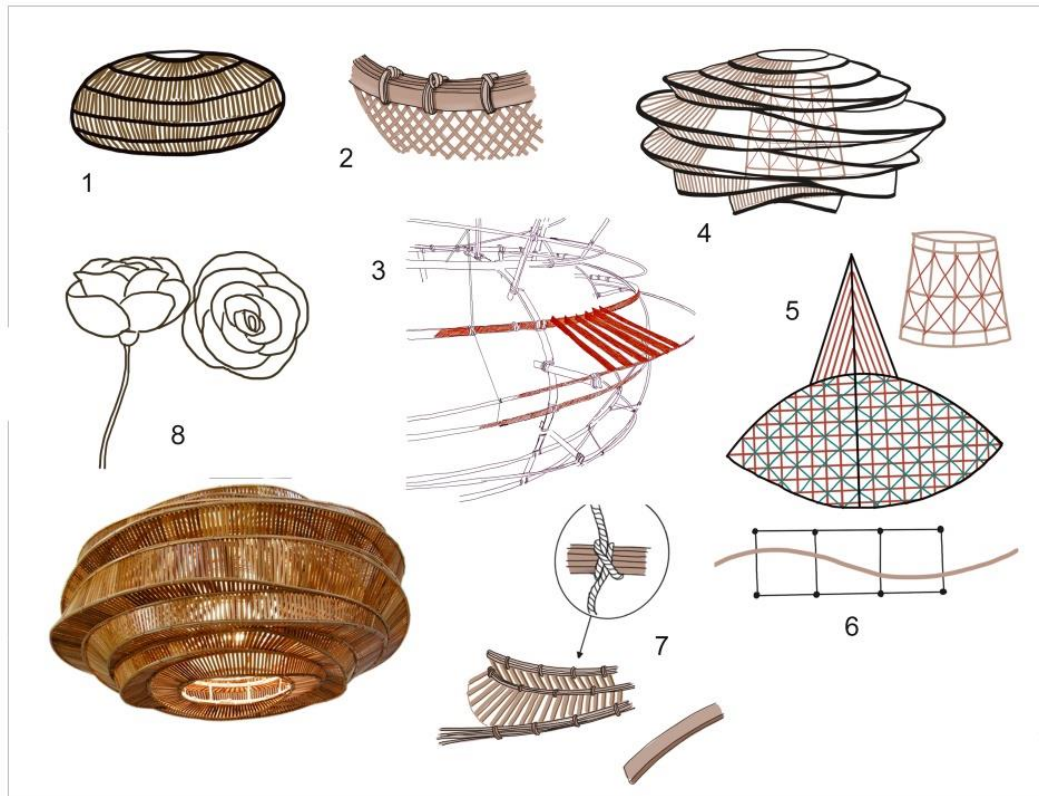


Figure 89 Illustration of techniquess tying with knots to create lamp with rose-like shape



In the design process, researcher experimented to build hanging lamp with the pattern that is complex making it a double-layered lamp. It was completed similar to how the threshing basket was tied to complete at its rim. Apart from tying, the lamp was three times with the hook knot and glued to strengthen the rope similar to how it is done for threshing basket for the internal structure of the rose lamp to strengthen the product. It is additionally strung with rope to build the soft structure with the support with vertical core in the work. The external feature was complete with fabric in the pattern of cylinder with the rope similar to kites to make the paper cover tight.

Internal structure with the layer in the shape of cylinder with rope similar to making of kites that tighten the Chula kites. With these techniques, when it is strung to the cylinder, it can be completed with fabric structure to make a complete look. The transparency of the fabric layer is more complicated. This is because it is produced with the soft structure that was completed with rope that well suits with fabric. The paper complete seems not suitable because it is not durable. The thin and flexible texture can make it a good fit adopted from the making of paper kites.

Cross structure of bamboo structure is made to tether the rope and bamboo to create dimension. The method to complete the hanging lamp edge is done first by glue to ensure that it is strong and complete with silicone glue to make bamboo flexible and durable for any condition. The edge was completed with tying a hook.

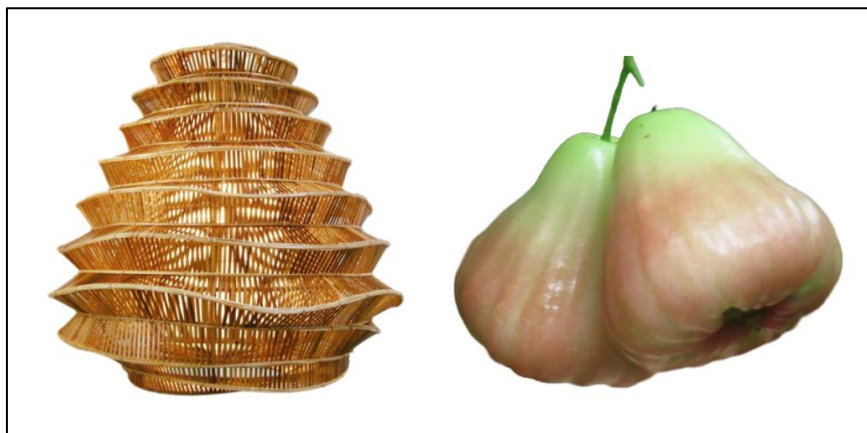
Lamp with rose pattern that was made with fabric inside to uncover the source of light. With the pattern of bamboo, it hides the edge of the cloth to give a dimmed light and shows dimension outside which the light is illuminated with the pattern of bamboo texture giving signature similar to rose giving soft-touched feeling.



*Figure 90 Raffle Sanya Hotel: Hanging lamp with rose pattern*

To summarize the design concept of the hanging lamp that was inspired by the pattern of roses that gives the feeling and sensation of orange color that is mild, warm, transparent but having the complication look similar to roses petals which actually the lamp is not aimed to illuminate, however, it is used in the dimmed condition to create atmosphere from the ceiling decoration. Hanging of lamp makes the shape and pattern outstanding in the open space, especially with the natural texture. The complication of bamboo strings gives the feeling of movement for vertical direction and the second layer with horizontal direction giving the illusion and dimension when seen.

### 3.4.2 Hanging lamp inspired by rose apple



*Figure 91 Hanging lamp inspired by rose apple*

#### Introduction and Inspiration

The idea for this creation of the hanging lamp with rose apple shape inspired by rose apple that has the shape of high coop. Researcher uses this rose apple-like shape for the creation of the hanging lamp and decorate with stripes serving as the conceptual ground of the creation of the lamp. This is the technical natural imitation with the knotting, hooking, and simple turn and two half hitches to create lamp with the dimmed light for internal decoration.

#### Approaches, skills, and methods

The creation started with creation of structure in the high coop shape and made the external structural curve ending both sides to create partial blockade of the strong lighting when people see up at the hanging lamp from the below position. The lamp was attached by sticking with sharpened bamboo around one by one to make a complete and the internal edge was bundled with bamboo in circle shape. Bundling uses the technique of hooking each part will be 2 inches' length larger than making of dish cover that the space between each is smaller.

When the internal completion had been finished, the third layer of the lamp was created. This layer was the creation of the shape with the symbolic surface with the feeling of touch. The making of the structure of this type of lamp was similar to bundling of blowfish kite using hooking technique for the structure line and external part was created with rope in the opposite direction to create soft touch creating tensile strength with flexibility.

When the main structure was completed, the bamboo that was sharpened in flat will be attached with the main structure with glue to create the layout and later fully formed top and bottom in the opposite direction.

The edge of the lamp was completed with bamboo sharpened with the round shape. The surface of the sharpened bamboo serves as the key component when combined to created strong curve to the close end and bundled with the hooking knot three times with two inches' space throughout the line.

When the shape is complete, there will be fabric structure to close each end and to create light system for functioning.

#### 3.4.3 Hanging lamp inspired by frog's eggs

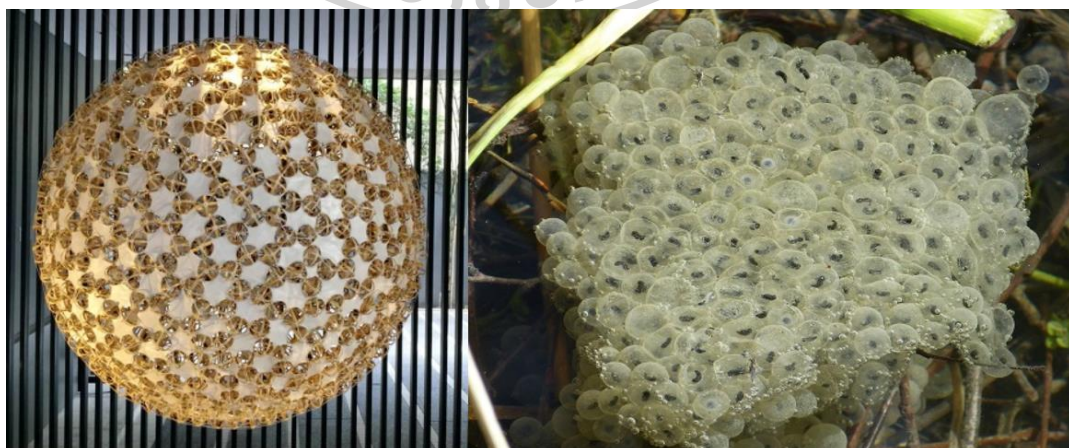
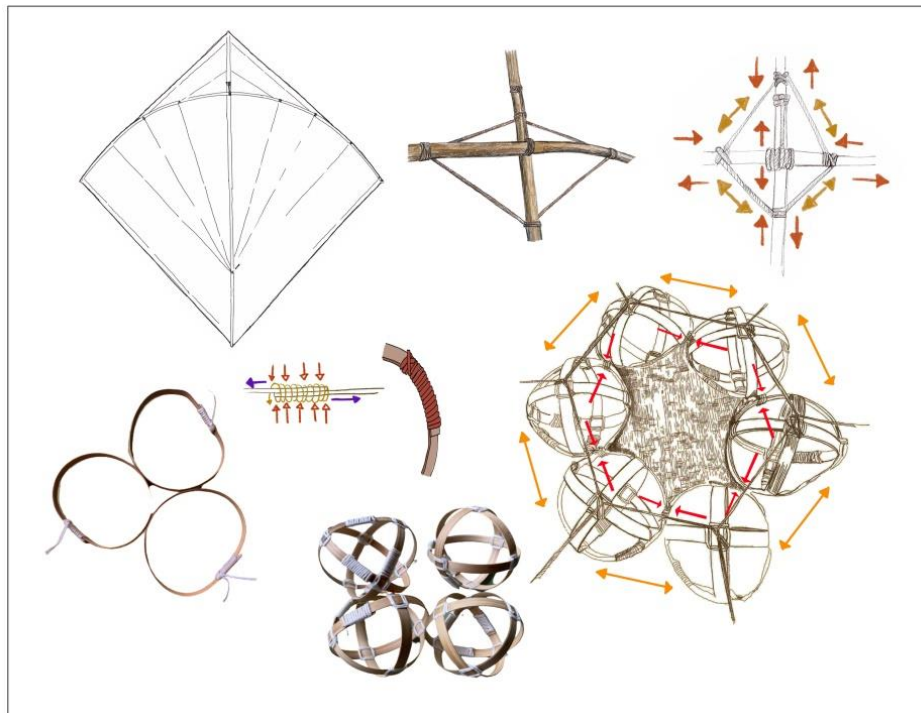


Figure 92 Hanging lamp inspired by frog's eggs

### Introduction and Inspiration

Researcher is inspired by frogs' eggs floating on the natural water surface and used this as conception in creating this piece of work. The shape of frogs' eggs is round and attached in pattern of eggs raft. Researcher, therefore, utilized this shape to create pattern by knotting and with wood joint with the tensile force of bamboo. The jointing technique was created by bundling and knitting rope together to create tensile force both pulling and pushing force.



*Figure 93 Hanging lamp inspired by frog's eggs the sketch design*

### Technique used for production

1. Knotting with wood to create ring shape and connect with knot and combine together to make muzzle ball
2. Combine six muzzle balls together to create a unit that has its own tensile force and cover with paper for the space between
3. Connect together to make a big-sized pattern by bundling with rope

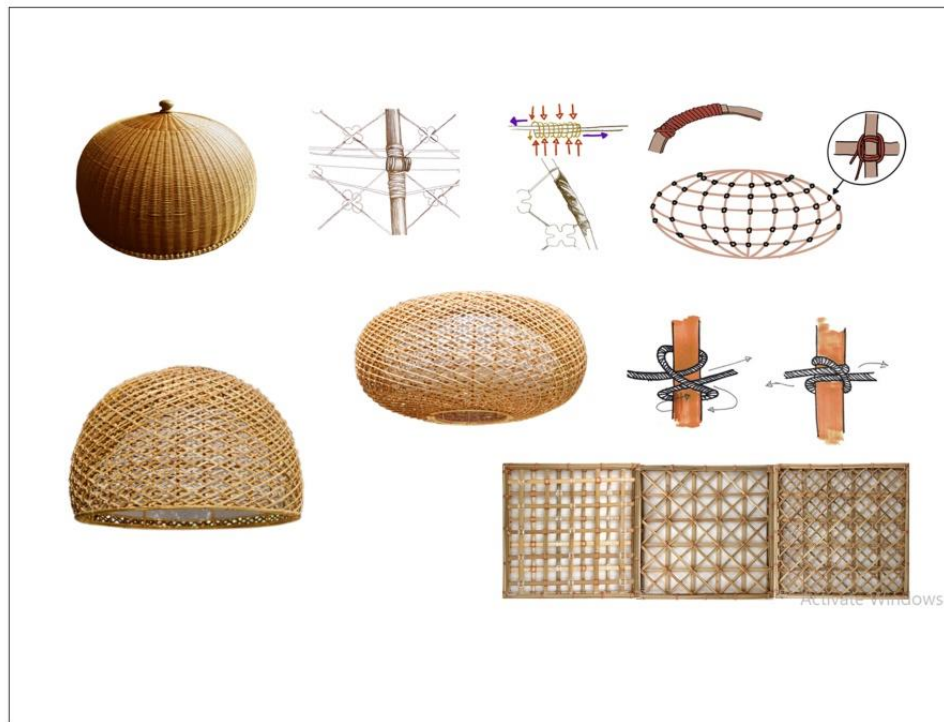
**Approaches, skills, and methods**

1. Technique to bundle with flat sharpened bamboo in ripen color (age: 3 years) to create curve shape
2. Connect each other by attach bamboo string together to create circle
3. connect each other

3.4.4 Hanging lamp in dish cover shape



*Figure 94 Hanging lamp in dish cover shape*



*Figure 95 Hanging lamp in dish cover shape and ketch Design*

#### Ideation for product creation

Ideation in creation of the lamp with the dish cover shape is represented by using bamboo sharpened in circle shape like how it is made for threshing basket that is made from the lighter color bamboo that is flexible and easy to curve. With the dense texture of bamboo, it makes it easy to curve so researcher uses this to form the structure by small knotting by hooking with soft wood. This is made together with creating the form with cross patterns between vertical and horizontal directions with the diagonal line of circle-shaped sharpened bamboo that looking like the shape of dish cover and can be further developed to make a circle shape. Knotting of rope for each small spots can create a strong formation. Researcher uses the interest form of dish cover to fully experiment hooking. Knotting with small bamboo and small spots is to create strength from layers of texture. With this technique, there is no need to puncture. Without puncturing the product, it can support up to 80 kg.

### Technique used for production

1. Bamboo sharpened in the circle sharpened by hands with the size of 2 mm. Using the ripen color- brighter color for the skin
2. Knotting and bundling utilized the technique crossing, jointing and hooking
3. Using the coop shape and dish cover shape for the guideline for creation

### Approaches, skills, and methods

Working approach is inspired by the shape of coop and dish cover by creating first frame by having the set-up of the vertical and horizontal lines.

1. Bundling to create a structure for vertical and horizontal lines with the size of 1.5 inches or 3 cm. structure created by bundling
2. When the structure is completed, using the circle-shaped bamboo to bundle together in the diagonal directions to create structure in the lean direction to create the cross for tensile support
3. Supporting from the oblique direction helps strengthen the shape by ensuring that it will not lean towards right or left directions but plane. This, however, can still have support and dimension.



3.4.5 Ground lamp made from coconut



Figure 96 Coconut Tree



Figure 97 Coconut Lamp

## Introduction and Inspiration

Ground lamp is inspired by the shape of the coconut tree and its ring from the internal part or its year circle. This was adopted and imagined to create the ground lamp by mixing different types of materials. To elaborate, stainless sheet to create the foundation of the lamp, and metal frame for the internal part to structure the lamp and completed the internal part with fabric to hide the illuminating sources not to have the full exposure of light and serve as the useful functions. The external part was decorated with patterns similar to coconut peels with dimension to create the core. The work was ended with bundling, hooking, jointing, and knotting.

## Technique used for production

1. Using the techniques to bundle ripen color bamboo and bamboo sharpened in the circle and flat shape to create flexibility when bending
2. Bundling and knotting are the important part to create the structure both vertical and horizontal lines
3. Hot glue was used to create the full form and completed with silicone to create flexibility as well as to endure impact.
4. Composition to create structure by tightening to create strength and joint makes the work more modern.

## Approaches, skills, and methods

Creation of coconut-shaped inspired lamp is the tall-shaped lamp with the height of 130 cm. with the diameter of 50 and 40 cm. The design was done by bamboo tree. This work piece can be located at the corner of room or next to sofa set to create the atmosphere in the upward direction. This can also be used for the living room or

balcony. The illumination of the lamp is dim to create lighting for the walkway to ensure proper exposure in the room (Leesuwan, 2015).

Coconut lamp utilized the same technique with rose-like lamp but the shape of it is cylinder. The shape, however, is different with slim shape in each part of the lamp to create different shapes that can suit different atmosphere and can be used in the different places like the hall, hotel, restaurant, reception area, or walkway.

To conclude the key takeaways from the design, the design of the coconut-like lamp can be used for further design ideas, such as; bedside lamp, hanging lamp, desk lamp applied for multi-purposes. This can create the contemporary values.

#### 3.4.6 Manoon lamp illumination in the temple fair



Figure 98 Temple festival lamp, Bangkhunsrai sub-district, Banlam district, Petchburi province

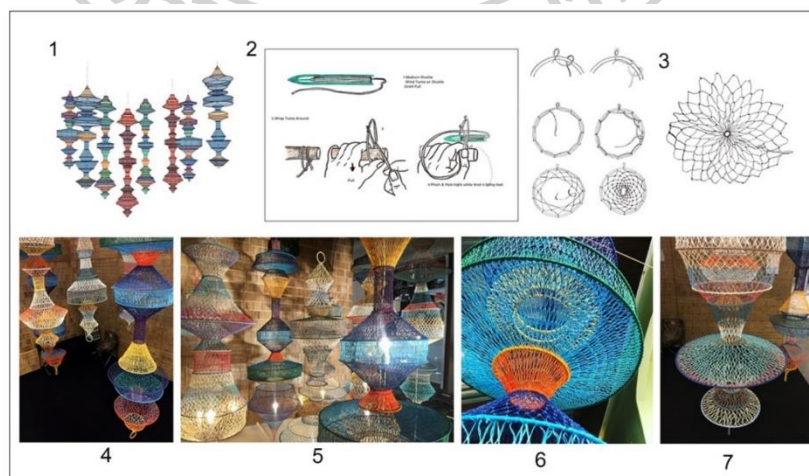


Figure 99 Manoon lamp created with fishing nets

### Ideation in creation of this product

Ideation and concept in making this product was inspired by festive lighting and illumination in the local temple fairs which applied the illumination in the night to guide the shape of the lamp and used the technique to knotting the fishing nets in layers and sorting colors. Knitting of the fishing nets can create interesting patterns that can be folded, flexible, straightened, and made in a circle shape. Knitting to connect, sorting of colors, and giving some spaces for ventilating and airy as well as flat is very easy for logistics.

### Techniques used for this production

1. Using the knotting of fishing nets with cross knot for its size for each layer for space counting
2. Creating patterns similar to crab trap, knitted in circle and layers along with the line of rattan and wire frame to straight from top to bottom.
3. Folding flat facilitates the low cost logistics and suitable for export, color adaptable and suitable for internal decoration

### Approaches, skills, and methods

Approaches and methods for creation of indigenous fishing nets can be adapted to create new products as well as utilized it for decorations in the modern style and leverage local culture. Modern design mixed with local handicraft techniques can create eye-catching shapes, especially with the selection of materials like rope. Utilizing rope for the production of things like rope coated with wax that is used for creating bags, belts, and shoes that can knitted to create different appearance and for usage. With vivid color and the mixture of colors in both hot and cool feeling, the selection of

contrast colors to create modern feeling and can fit with different design of surrounding environment. Researcher created this piece of work by adopting from indigenous production of local fishing nets with the contemporary materials. With high and low dimension technique combined with imagination, regardless whether it is illuminated or not, can give the feeling of modernity. The creation of work by the craftsman can be created value from leveraging from the existing skills which can serve as sources of income.

### 3.4.7 Conceptual Analysis Conclusion

Inspiration from nature can be categorized in two different types, namely; living and non-living ones which are majorly the surrounding environments. Natural shapes are inspired by knotting and tying. In tying and knotting for the furniture, the key emphasis is with the strength and support and understanding of the joints through the knotting and tying which are practically useful in different aspects;

1. Creation of structure that can support human weight
2. Deriving of characteristic technique
3. Utilizing skills for details completion
4. Coming up with the new technique to facilitate working process

Studying methods in tying, knotting, bamboo material, and rope can be highly developed for extended purposes through learning methods and techniques to be utilized in creative work, knowing processes, techniques, methods from material acquisition and material preparation which each step is meaningful in the creative process to know originality of rope and bamboo and to tie the rope correctly. Therefore, it is useful to adjust the skills of local craftsmen to be able to work on products and creative work. In the current context, relevant governmental agencies should implement the following action. To elaborate, local techniques and expertise should be utilized in

material selection, produce materials, able to bring materials in the community to sell to create a grassroots economy to make money by the community themselves to generate income from a fair show as well as to create a network and promote it through using social networks.

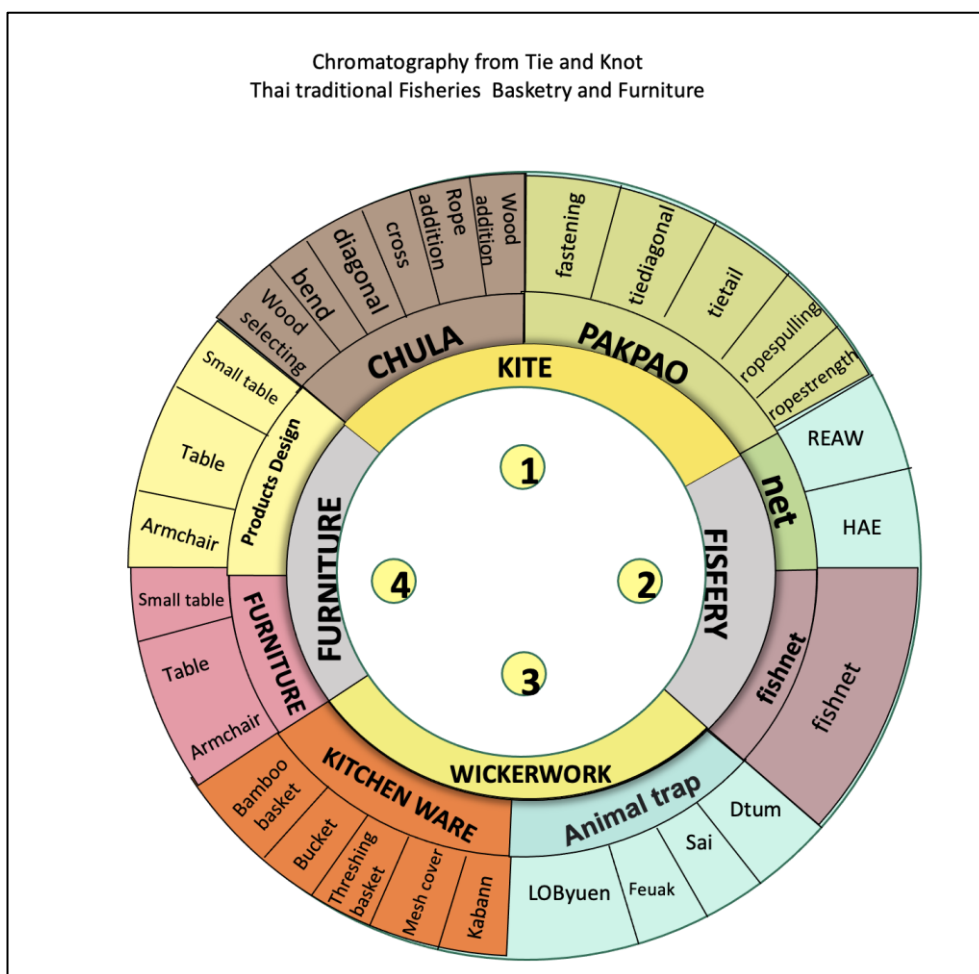


Figure 100 Table to demonstrate knitting and skills for creation of such piece



## Chapter 4

### DESIGN IMPLEMENTATION AND REFLECTION

Designing of products and creating requires for certain level the observational skills with the linkage with living things or objects. This skill that we learn or acquire mixed with the understanding of shapes and patterns can contribute to the design, for instance, bundling or knotting in the fishermen's village that can be served or taken as useful application for production or other handicrafts. The creation of work from bundling and knotting, such as; rope with bamboo, making of kites, creation of fishing nets, basketry, creation of furniture can be adopted from these techniques. This can be applied into three different key areas;

1. Home decoration
2. Production of furniture
3. Artistic decoration

The design approach has to be ensured that the approach is contemporary, modern, and easily applicable for daily usage. In addition, it can be used for the area exhibition or symbolic work to create memories of the previous time that is still usable in the modern context. Therefore, bundling approach can be extended and differentiated from conventional way of home decoration. This includes self-doing or instructing handymen to build or adjust their techniques to create jobs in the community or academic purposes.

Using of skills, techniques, and methods that belong to communities, researcher utilized these techniques for creation and ideation of work, especially for product design and decoration. This has been done by the concept from nature and surrounding to create bundling technique to create shapes and forms. This is bundling and knotting are actually basic steps for community productions when leveraged the



pieces of work can be used for decoration and for living in the modern societies. This can be used and the handcraft that gives different experiences.

Based on such creation approach, application of this can be utilized in societies and installed for the for use in the real areas. From the process that research worked to create products, researcher came up with opinions and feedbacks that can be used as the guidelines, such as; preparation of materials, production, and planning for logistics, edition, completion, travel to sites, and onsite installation. These processes contribute to the completion of work pieces with the considerations of surrounding communities to provide moderate illumination. The result can be summarized as table below.

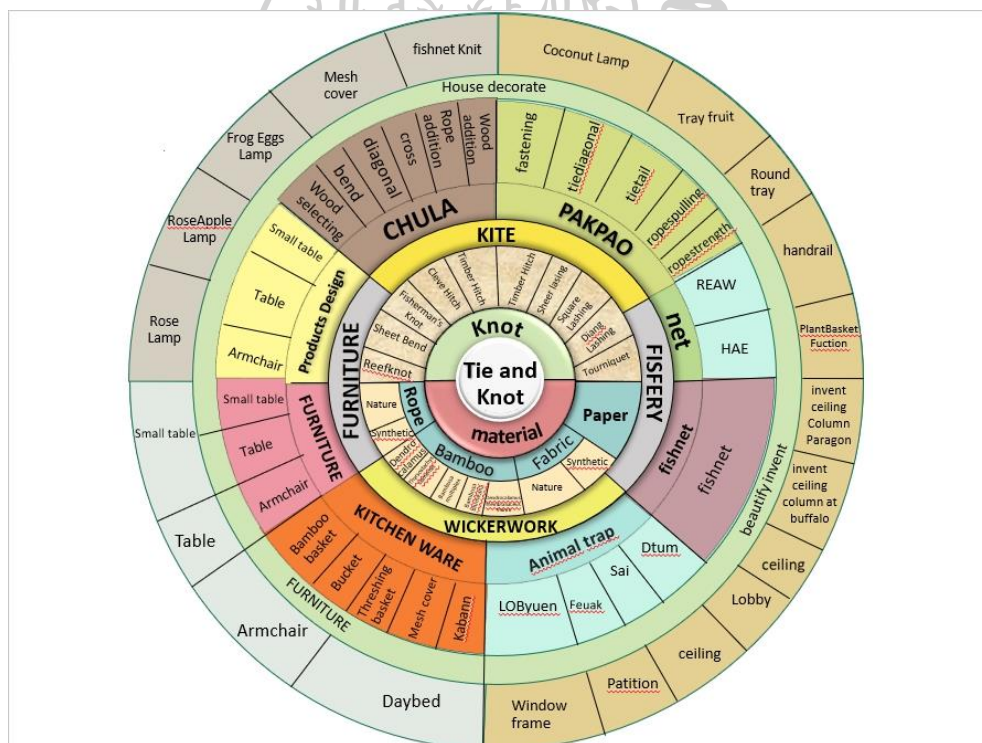


Figure 101 Table study process, knottign and bundling, skills for creation of work

In creation of work from this research, the ideation and concept were inspired by the shape of nature and surrounding as referred in the chapter 3. Based on such ideas, researcher, therefore, developed through practice-led approach by interpreting in

picture to create concept and new knowledge in the three areas; Home decoration, Production of furniture, Artistic decoration.

#### 4.1 Art Object

##### 4.1.1 Fruit tray TR001



Figure 102 Stadium Stade de France and fruit tray

Concept of this creation of the fruit tray number 1 was inspired by playing football. Researcher saw the dented football, therefore, utilized the shape to create fruit tray as well as see the stadium from foreign country so developing the fruit tray that was done by smashing with stainless hammer. Mixture of stuffs creates new dimension for decoration. The edge of the fruit tray was completed with basketry technique, bundling, knotting and connecting with the line of wood making it an oval shape.

#### Techniques

1. Bundling with the techniques of bamboo connecting and multiple circles to fit with circumference

2. Bundling the horizontal lines straight by connecting joints by opposite to circle shape is connecting point. Using the rope to give tensile force horizontal to the ground
3. Include pattern and characteristics to the shape

Guideline, skills, and approaches for product design for the fruit tray No.1 are the design that indicate the feeling of contemporary. Researcher benchmarked design with international patterns for hall, living room, table, living room furniture set to be suitable for such decoration to make sure that the fruit tray can be used suitable decoration. This is to create the handicraft that is modern. Based from the experience of the production, it can be said that there were risks associated in forming the pattern as well as risk from asymmetric.

Therefore, practicing or implementation requires understanding of materials and experiences in working, procedure, and to get the work done with completeness and with suitable sizing.

#### 4.1.2 Fruit tray 4.1.8TR 002

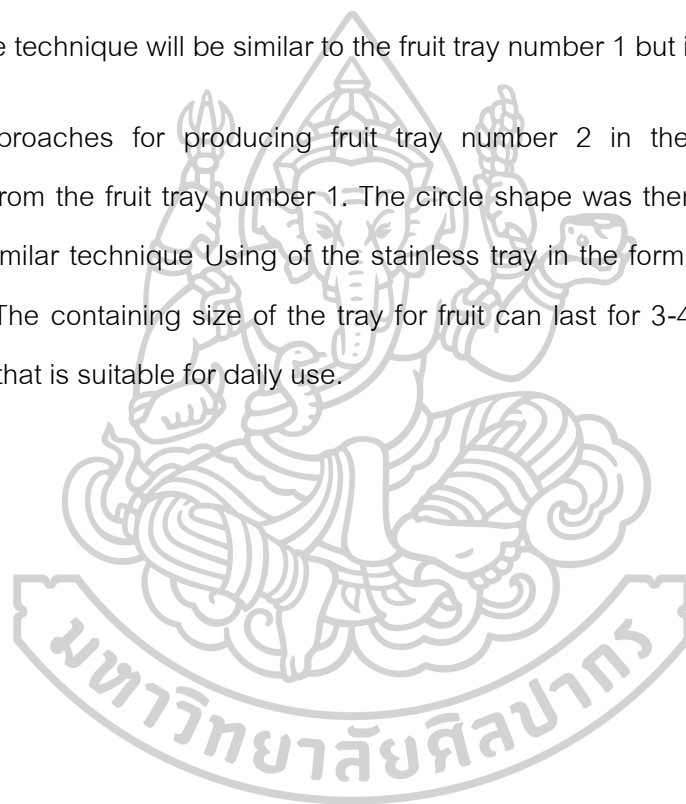


Figure 103 Fruit Tray

Ideation of this fruit tray number 2 was inspired by the fruit tray number 1 from playing football. Researcher saw the dented ball and from that developed the fruit tray and seeing the football stadium in foreign country, therefore, developed the mixture of local techniques that made from technique of hammering with the stainless hammers to create decoration dimension. The completion of work was done by technique of basketry, bundling, and knotting at the intersection of the frame. The complete across the work was done with the long line to create circle shape.

The technique will be similar to the fruit tray number 1 but in the circle shape

Approaches for producing fruit tray number 2 in the circle shape were developed from the fruit tray number 1. The circle shape was there for more balanced with quite similar technique Using of the stainless tray in the form of bowl fits well with the shape. The containing size of the tray for fruit can last for 3-4 days or with weight about 1 kg. that is suitable for daily use.



## 4.2 Furniture

### 4.2.1 Armchair

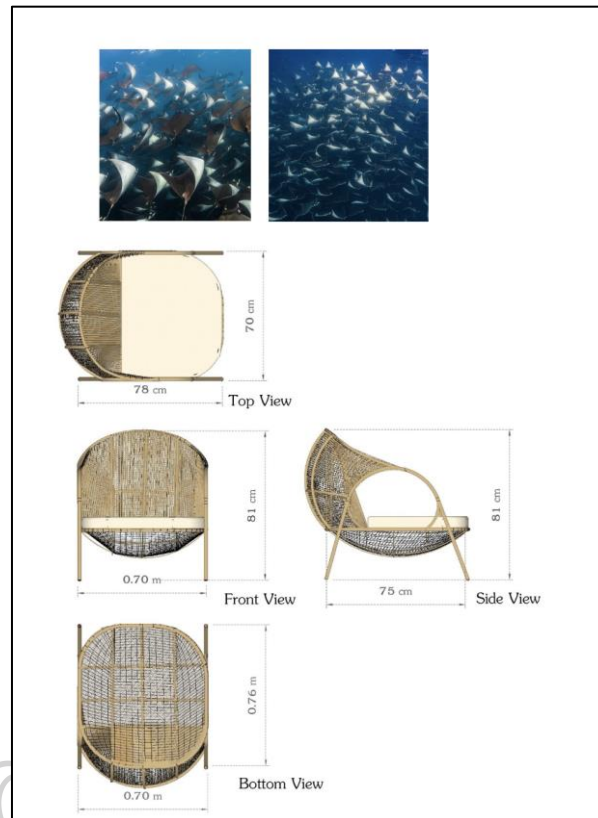


Figure 104 Armchair : Sketch Design

Ideation for the creation of this armchair product was inspired by the shape of stingray which applied the bundling and knotting techniques for product development with the mixture of metal materials for support. Bundling technique was used for decoration with flat bamboo for back supporting part with the hooking technique but making it easier by rolling, folding in order to create back supporting part.

#### Techniques

1. Design by drawing and framing with metal frame for support and make ratio

2. Using bamboo by bundling and hooking with the grid technique and using frame to create crossing

Creating the back supporting part with bamboo sharpened in the flat shape made by hooking technique bundling, rolling, knitting of rope with the bamboo part. The edge was completed by bundling with bamboo by using bamboo sharpened in the circle shape by hands with the same surface touch. This was finished with seating cushion and back cushion made by sponge for decoration. When it rains, the cushion can be removed and they can be changed to fit with the other atmosphere styles.



*Figure 105 Armchair : FinalDesign*

Approaches, skills, and methods utilized for design of this stingray chair were inspired by stingray for its curve and wings. The design is suitable for living rooms, reception rooms, hotel lobby, hotel room and restaurant that us decorated in the concept of "Summer Resort and Sea".

The characteristics is with the touch of nature made by hands, knotting, and use of bamboo texture to give natural touch. The toning is warm yellow and the work was completed by dark yellow rope to give emphasis on white, grey, and black.

Practical usage of armchairs is based on the design for person with the height of 155 cm. to fully fit the body making body angle of 100-110 degree with the cushion to support leaning making comfortable and relaxing feeling. With the arms support, when leaning still makes it possible with the gesture that would create body pain. The overall design is natural with colorful feature and using bundling as part of the work presentation.

#### 4.2.2 Day Bed



*Figure 106 Day Bed : Concept Comparing*

Concept for the creation of this product “Daybed Sapata No. 1” was inspired by the making of sparrow nest to create structure, frame, and the utilization of spacing to make a semi-function of daybed that uses for relaxation and nap for domestic purpose. This can help create relaxation atmosphere and art piece that can be used with characteristics. The use of the nest shape can serve in number of purposes.

## Techniques

1. Forming by using wrought iron and design model for the early stage and trial with movement to create the good structure for pressure to fit for purpose
2. Create bamboo pattern to create characteristics of external patterns of vine with emotion and with the movement of line and coil to soften the harshness of the pattern.
3. Creating products with the functional frame that can be used for laying or sleeping is good in its multi-purpose with cushions. With the bamboo pattern of home curtain will make this fit.

Approaches, skills, and methods for this daybed Sapata were designed to be used in the living room or guest room, hall, or multi-purpose room. The objective of od this pattern of bamboo coil similar to the movement of vine is to create special atmosphere for the area to impress those who see. This can be further developed to be used in spa, coffee shop, or food court.

The work has its clear characteristics with the bundling and knotting of bamboo in the soft coil style giving the feeling of movement with artistic dimension making people impressed

### 4.2.3 Table





*Figure 107 Table : Concept Comparing*

Concepts in the design of this product for this golden table was inspired by Thai litter by differentiating from the original version by considering and including different of natural movement to decorate the table. This table can be used in the living room but not serving as dining table rather for tea time or coffee brake table. This table is suitable to be used in the open space room to provide space. This represents the initial objective of the Thai litter that is used for casual purpose.

#### Techniques

1. The functioning of the table is similar to litter with the function of table
2. Using the bundling and knotting technique, hooking, bamboo joints, using of material, and the top with glass to create modern touch
3. Creating patterns and having different colors for decorations to make it durable for use

Using the technique to connect bamboo for the edge and using bamboo sharpened in circle to cover up joints and seam for complete look. In the draft, the design was to provide more space on the table by giving more layer for 30 cm. to provide utility and space.

Approaches, skills, and methods were based on the thinking of usage to create utility in room and place. Research used the technique of bundling and knotting to create patterns together with putting in the layers to create dimension of the work to create a table that can be used in the living area or in the hall prior to the meeting room. The color option, therefore, was vivid to attract audience with the handicraft and

bamboo work with represents the true material color. This is aimed to indicate the test of the owner.

This table sculpture was made in shape with the lining, color, and shadow in yellow similar to gold. The glass work is with earl grey mixed color with gold aligned with the color of bamboo. Forming of the table was made by creating legs and table part up top in parallel to have balance and the lining movement gives the symphony feeling of the modern piece of architecture that similar to box. This type of sculpture, therefore, is outstanding in its shape and form as well as color. This includes the freeform of patterning that is eye-catching and suitable for purpose and be fully utilized for its major purposes.

#### 4.2.4 Stool



Figure 108 Stool : Sketxh Design

Concept in creation of this work for the stool to serve as the middle table give the feeling of old time inspired by old time stool. The techniques used in this creation include knotting and bundling with bamboo with the metal work to create form. The pattern was made with the bundling technique that give the airy feeling differentiating from the existing previous technique. Bundling with bamboo gives the new method that introduce the revival of the previous time skills for modern usage

#### Techniques

5. Forming technique is by drawing and design ratio based on the real use
6. Forming of the metal frame and bending with technique
7. Using sharpened bamboo in the circle shape and material of the bamboo surface with the bundling technique
8. Working with the swag-shaped structure like Kah-sing table. Complete form will be topped with glass

Approaches, skills, and methods for this stool was done by the techniques of knotting and bundling showing out the internal structure that was made by handicraft and industrial efforts. The frame was made with metal material to give strength to the piece of work that can support multi-purposes usage. The mixture between industrial material and natural lining with decoration to show out materials make its eye-catching when used. The solid and heavy design was transformed to make it look airy and simple suitable for the modern time. This gives more room and spaced to the room.

#### 4.3 Decorative Art

Bundling can be applied to relate to wall or ceiling artworks or the decoration pattern in the hall or with the pillar that gives feeling of space as followings;

4.3.1 Wall decoration



Figure 109 Wall Decoration : concept idea



Figure 110 Iniara draft

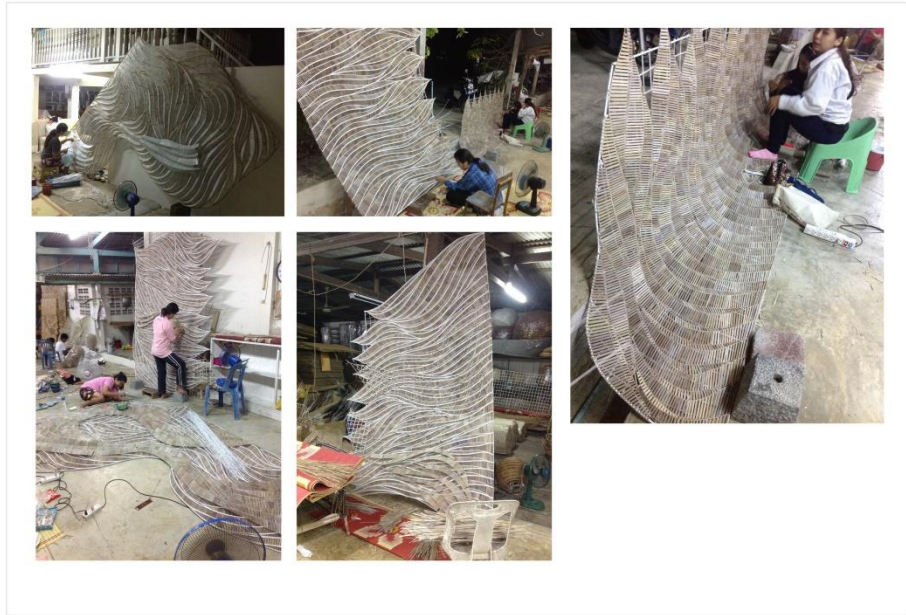


Figure 111 Project progress



Figure 112 Installation of work



*Figure 113 Installation phase*

Concept in developing of this product- wall decoration was inspired by plant type that covers cliff, cave wall, ivy in the jungle. The creation of the work shows complexity with the bamboo work to create beauty and character for the hotels or resorts of this decoration.

#### Techniques

Having received the brief from the architect to design interior design, the draft was done by hands to create pattern of movement in artistic way with technique that aligns with curve of the space

Presentation and formation of work were done by creating a model and build similar to the model design in the ratio of 1:1 to ensure that the product us similar to the actual spacing. Design was drafted first and followed with bundling of bamboo

Subsequent to drawing, the formation of structure will be done with stainless metal. The formation was done in the table template with rope bundling to provide foundation and pattern in the real space.

The frame with pattern was created with the flat sharpened bamboo. The edge was completed with flat bamboo and round bamboo with hook that can be connected with each other one.

For the next step, it was the logistics of the work parts to the site for installation. Each piece of work is the size of small truck. So, the transport of each piece requires good calculation.

The team travelled to site to install the work as per the draft and complete the wall work by checking first on what was the previous material of the wall to ensure that it can be installed with the hanging threaded nut. The work was completed by closing up the remaining gaps and space.

Approaches, skills, and methods used for development of the wall decoration work Indra was the relatively large piece of work in the room with white background. The bamboo has to be dyed to soften its natural color and dyed with white. Dying out process was first required which was done by sandpaper and completed the edge with white color to match the color with the room setting.

Decoration together with interior design requires collaboration and description for the team members. And the owner of the project must at least have overview on how the project will look like. Therefore, presentation of the work must show as much as detail as possible. The sketch, model, and previous work have to be provided to ensure that the complete work will be similar to the agreed one. And this is to ensure that the room will have character of handicraft.

This Indra work has its strong character because the flow of the work that connects to the seating areas reflecting the board and beyond imagination of work. This left behind the conventional work of bit of pieces with harmony. The added function is bedding that make this artistic sculpture eye-catching for accommodation and memorable resonating the Thai culture of handicraft like those techniques used for kites.

These techniques include simple bundling and knotting of work to create complexity with folding of fabric to cover the seam. This is to cover the seam when in use. Techniques and skills can be adaptable and applicable for the handymen that were trained to work in different nature of work that is new to them. The learning of the work made them skillful and can work in different setting from their main occupation.

1. Techniques for handicraft if applied and increased capacity can contribute to the new piece of work. This will lead to the new dimension and give way for survival for work.
2. Using handicraft technique with bamboo bundling when presented in the work gives a high value and can create value to the project. This can be served as narration to the project.
3. Each of the process has to be presented to those that are interested which create new opportunities for contractors to work in different natures of projects. This is thanks to Ministry of Commerce and D-Mark project that allow contractors to present this project in Milan, Italy which allowed the contractors to create project in Thailand.
4. Creation of work is the mixture of materials which we could create the points of impacts, creativity, and modernity based on our imagination through local knowledge representing local culture to international eyes.



#### 4.3.2 Decoration of window façade



Figure 114 Decoration of window façade: concept idea

Concept behind the creation of window or doors façade was inspired by the vine, and the movement of plant in different directions that create circle, coil. The techniques will be done with attaching of bamboo and bundling with the window space covering with the mosaic and create jamb with bamboo colored in white to create frame and dimension.

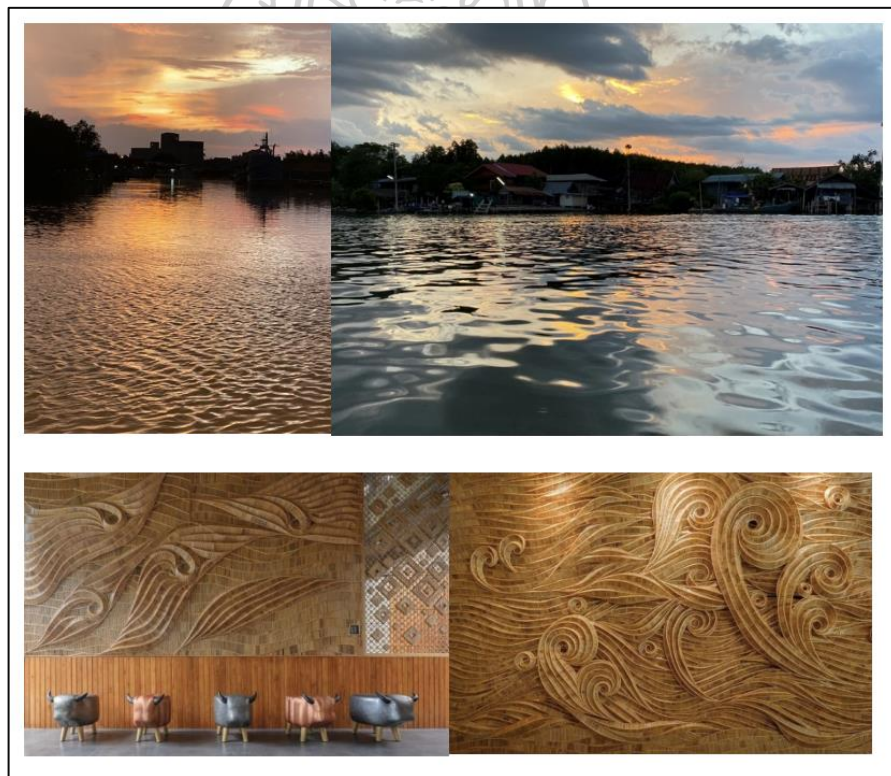
#### Technique

1. Sketch in alignment with window frame
2. Creating work by drawing window in different size as the real one and make the curve similar to the real window
3. Creating the metal frame and product that responds to the curve
4. Creating the product similar to the metal structure that was previously prepared by bamboo bundling in the cross table format to serve as the foundation.

5. Attachments with patterns as designed with flat bamboo and complete the end with remaining and round bamboo with hooking and complete the end with by rolling inside.

Approaches, skills, and methods to create windows façade make the work of bamboo decoration look nice looking western. The usage of façade and decorations create interesting dimension with the mosaic background and vine.

#### 4.3.3 Creation with wall decoration



*Figure 115 Creation with wall decoration idea*



*Figure 116 wall decoration*

Idea used in design and implement wall decoration for the buffalo hotel's lobby in Ampawa was inspired by river and currents because Samut Songkram is the province with river and fresh water, seawater, and brackish one. The river is perceived to be living thing that inspires to create golden river and provide complication like glittering of water under sunshine. The color of bamboo material that was used for decoration on the backdrop of the counter helps create character of work and give a good memory for the guests. The creation of wok at the lobby reception shows the design that aligns with contextual background and that makes it impressive scene for those who see.

#### Techniques

1. Measure areas of work to create the wall work by bamboo and create bamboo frame as necessary. This includes giving it movement and glitter that makes it look like water.
2. Create each part of the work that will be easy for logistical purpose.

3. Create table frame
4. Create patterns and dimension and cover with flat bamboo and complete with round bamboo that was sharpened by hands, bundling, hooking, and bamboo joint connecting
5. Complete the work with detailing

Approaches, skills, and methods of the work on river was created with the inspiration of river in Samut Sonkram that you can see the glittering of water and present it at the hotel lobby of Buffalo Hotel in Amphawa with the technique of bundling of bamboo that create the work with color shading, shadow, and dimension. With these pieces of work, it gives yellow shading of color and reflection. The light and shade interact very interestingly to each other and it can be clearly seen in terms of functions that gives the beautiful touch. This gives luxury touch and character of the handicraft to the area.

1. Product and the piece of work can give impression with the material
2. Creation guideline and dimension give wall with dimension that aligns with the decoration
3. Having impression on the work will create determination, commitment that will lead to success.

This piece of work gives good impression to those at the lobby.

#### 4.3.4 Ceiling



*Figure 117 Ceiling ideation comparing*

Ideation in this creation of wall and ceiling decoration was inspired by trees, and mangrove forest to create decorated ceiling for guests' hall and coffee shop in the Buffalo Hotel- called Buffalo Coffee. The technique used was bundling, roping, and hooking. The technique has to attach to each other so it was call granny and grandson technique.

#### Technique

1. Technique used to create ceiling with the granny and grandson bundling technique to make the bamboo straight.
2. Measure bamboo to make them fit to each other. This will make them not to show the seam
3. Create scaffolding to knit bamboo along the frame in the horizontal direction. So you can create step by step
4. Make this neat complete

Approaches, skills, and methods used to create wall and ceiling decoration will need to sit in different seating positions and do knitting at the same time one by one. Working together in the group can create a good working atmosphere that allows you to socialize. The work with this technique is interesting as you do not require to have to nail that would leave unnecessary strains that would allow bamboo to endure and stay long. The rope bundling technique that make bamboo straight not only makes this eye-catching but also neat.

#### 4.3.5 Decoration of restaurant



*Figure 118 Decoration of restaurant concept ideat*



*Figure 119 Decoration of restaurant*



Figure 120 Decoration of restaurant

Ideation to create this product ceiling decoration in the restaurant was inspired by flowers, trees, and leaves that give emotion and soft touch. The decoration gives the love emotion and care that roll together. The idea was implemented by bundling together of bamboo with hooking and rope jointing technique to fit with the building structure and to create relaxed atmosphere.

#### Technique

1. Create a metal frame on the site to create fit-in decorations. The making is done by using scaffolding and wrought iron conveniently. This process of work requires a lot of effort as there will be constant movement of frame.
2. When complete with the metal frame, the next step is the completion of the metal frame with bamboo that would require precise positioning and the would be covered with rust protective substance.
3. Lift up the complete piece of work in the designated position and cover with flat piece of bamboo. This will require the cover of the structure. This also requires precision as each decoration part needs to be in exact positions.

4. Work on the second layer pattern, this will be done on the second floor. The placement should be seamless and covers the first layer.

Installation of the work is done by joining metal pieces to the wall and use bamboo pieces to cover the work seams. This will require setup of the scaffolding for decoration work. The completion of some part of the work was done prior in the factory so to ensure saving time. The working process on-site will have clear division of labor some work under to send up materials, some work on the scaffolding to complete the major part of the work.

Approaches, skills, and methods for the wall decoration of Rusty Rose restaurant was done with bundling to attach bamboo with the spaces to create work that has character to create nice atmosphere in the restaurant. This work was inspired by vine, tree, leaves that gives the natural colors and feeling of nature. The shading of the premise after having decorated this will give the sunshine feel of golden color.

1. Complete work will give 100% valuation of the decorated areas
2. Final product can create the new skill in bundling of bamboo which will differentiate from the previous ways of doing this. This will give the nice shading of gold and dimension.
3. Creative final product must still be in the same flow with the other decorations. The poles have to be covered with colors work.
4. Lighting will not be included in this area because it requires proper illumination in each positioning, including air-conditioning system, speakers, lamps. These



components contribute to the general atmosphere of the room.

#### 4.3.6 Decoration of poles and ceiling



Figure 121 Decoration of poles and ceiling ideation



Figure 122 Decoration of poles and ceiling, sketch design



*Figure 123 Decoration of poles and ceiling*

Ideation that was the background in developing of this product for ceiling in the department store was inspired by vine that crawls around the trees giving the contrast shading as well as the beauty of the place to show the continuous flowing and movement. This gives new fresh feeling for the department store. This will require the individual shops to decorate in the same way to ensure that this will be harmonious and consistent, however, this piece of work focuses on decoration and beatification of surface. The work with architect was co-creation and project owner had role in helping and making project successful with thinking process. This will have together with different technicians with the clear objectives and respond to them. Working together should be a clear and open process that allows direct and clear discussion.

Working techniques are as followings;

1. The common areas were assigned for the contractor to proceed for the decoration work
2. Measure spaces as per the agreed ratio and create symbolic pieces of work by the bundling technique with bamboo to create products that cover poles with fabric decoration
3. Design together with drafting must consider the electrical system that was embedded, for example, position of the fire service or the positioning of the decoration branches that have to be taken into consideration with draft.
4. Products and pieces of work created sometimes have to be used in the crowded areas like department stores. So the working shift can be during the night time so it has to be managed to relate to other schedule.

5. Working for this project will impact the sleeping schedule as the working time allows only from 11.00 pm to 03.00 am. This period of time is supposed to be for resting. So this concerns issues of health and safety.
6. Design and installation of work throughout the project has taken approximately 12 months since design until installation. This has created common grounding and sharing on practices.

#### Approaches, skills, and methods

Products poles, wall, and ceiling decorations have a flow movement that create impact and make the areas interesting and create a good atmosphere like vine in the nature. The work was completed by coordination and work between many parties to create different interesting pieces of work with these following key findings;

1. We work to create this work with proportion, ratio and the extension from the sketch
2. Working together creates pieces of arts more important and practical at the end. To elaborate, the placement of air-conditioning system and fire system were calculated.
3. Working in the department store requires very good time management as the work is done in the night time at around 11.00 pm which the department store is closed but will have to leave for maintenance.
4. Working has to be well planned and will impact the sleep schedule. So the best way is that you have to follow the plan to ensure that the time is not wasted. Working in the night time will require you to

be very efficient and will have to manage the possibility of exhaustion so safety is priority.

5. The complete work will definitely give impression to those who witness and will be good place for nice work and decoration as well as the utility and areas will be interesting. The areas around the poles can be utilized for commercial purpose and to be area that protects the pieces of arts from being destroyed.

#### 4.3.7 Plant baskets



*Figure 124 Plant baskets concept idea*

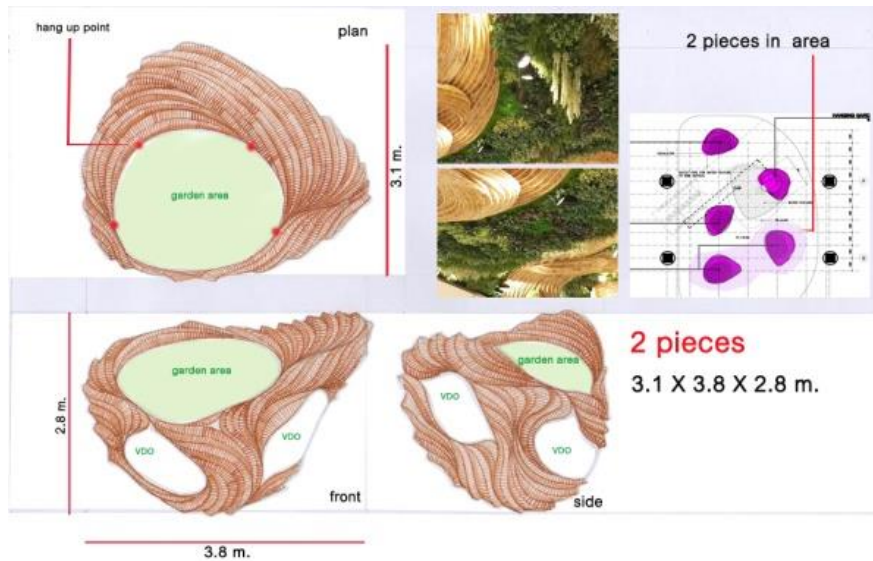


Figure 125 Plant baskets, sketch design

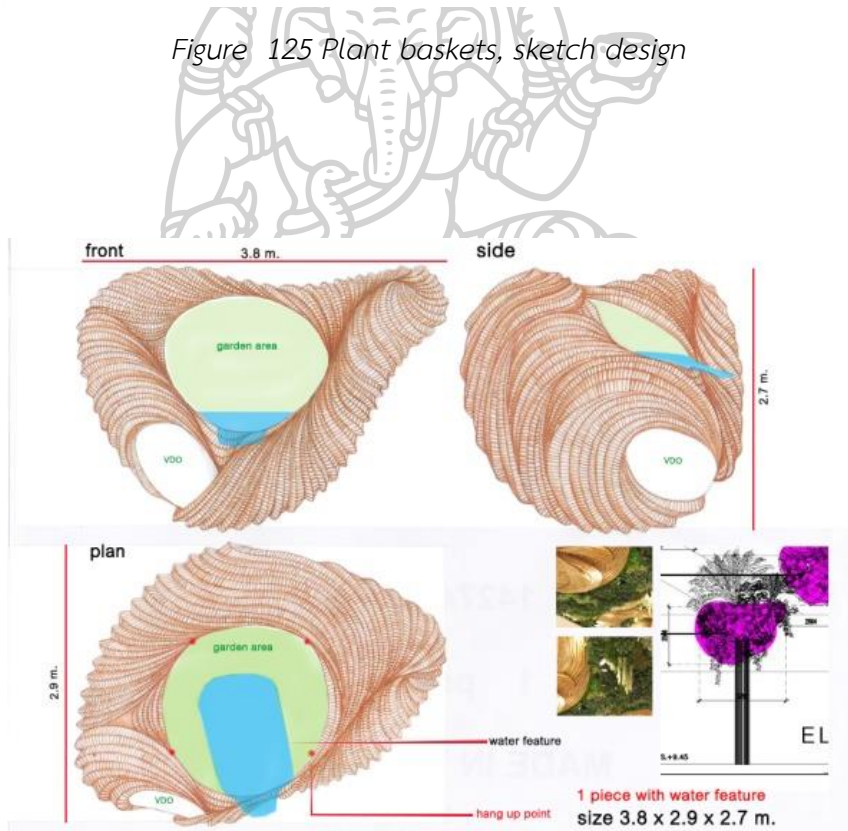


Figure 126 Plant baskets, sketch design

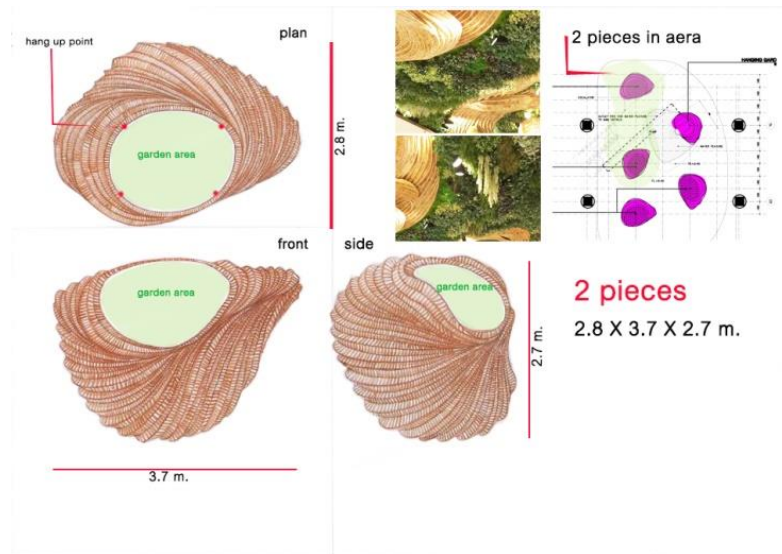


Figure 127 Plant baskets, sketch design



Figure 128 Plant baskets

Ideation in creation of this piece of work flower baskets was inspired by the shape of parasite plant as well as fern. The small flowers and trees around the big tree gets researcher to the idea of this creation. The handicraft was the bundling type of work mixed with artificial plant.

Techniques used for this hanging plantation has been in the process of planning and this project was done together with the department store in Burma. The nature of work will have to start with checking the capacity to hold weight for the areas that the pieces of work will be hung on. This includes detailed planning to work in the high ground that requires safety. The hanging process has to be thoroughly checked to ensure that it is safe.

The production will be as per the order to complete the designated areas with the metal frames and the hangers. The hooking techniques are used for this decorations and the complete pieces of work will be equipped. The wooden boxes will be used if the products or pieces of work have to be transported or exported. The wooden boxes are used for containing the products and when remove the products out, the boxes will be cut open by sawing which will take less time to remove things piece by piece. Installation will be done on-site and the equipment will be in place prepared to complete the work. To summarize, when our team part is completed, the tree installation team can do their work with machine at the agreed positions.

Approaches, skills, and methods used for the creation of flower basket with 25 meters' height was inspired by parasites and fern and the nature feeling of the small plants that are attached to the main trees. This product requires strong bundling and attachment and there should be hanging spots with slings to be used in the open space/hall of the department store. When the piece of work was hung up to the ceiling, there will be open space on the ground for the personnel to work. The work helps create atmosphere and dimension with layering. Learning that the team learnt from this project includes;

1. Using of electric hoist to carry the products is good in the sense that it can carry twice weight.
2. Potential problem is that the sling can be tangled when it carries heavy weight stuffs. The tangling will get into the core and will stop the pulling to the top due to the tangling part. The can create difficulty in the high floor that can create unsafe condition. This is quite a difficult experience for working during night time.
3. Hanging hoist should not be one with sling but should be chain hoist with capacity of 500 kg. and there should be a chain bag to prevent the possibility of tangling and problem when it is too heavy.

The hanging work is useful to decorate the hall and eye-catching when seen from far that gives a very nice and impressive outlook. This can be photo spot for visitors and give dimensional feeling for the space.

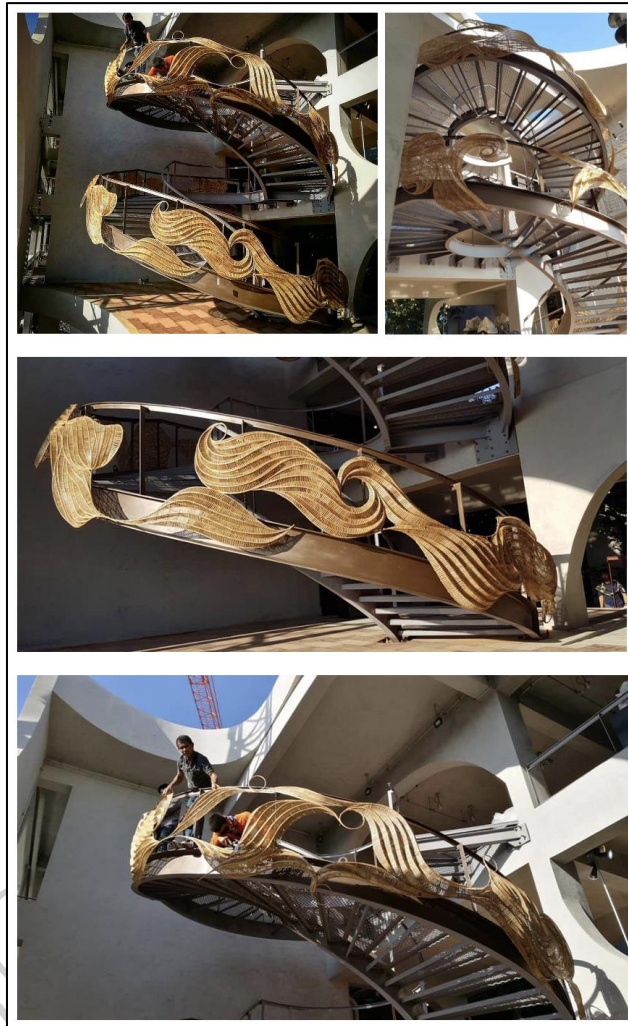
#### 4.3.8 Stairs case

Ideation for the creation of decorated stairs case for Satian Dhammasatan was with the problem to create the frame to connect the next floor. This piece of work was inspired by vine in the jungle but give the meaning of life of walking up and down. This shows the flow and movements of lines. This shows how life is made to build up step by step like going up to the staircases.





*Figure 129 Stairs case, concept idea*



*Figure 130 Stairs case, concept idea*

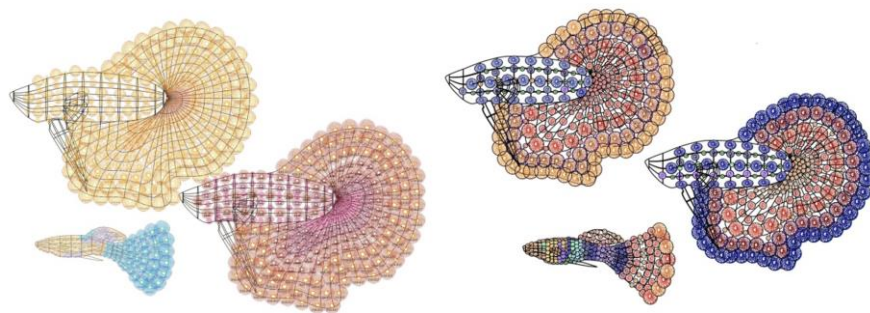
#### Techniques

1. Conduct site-visit and to create work to ensure 3D deliverable
2. Create up the frame and structure with standardized program and create the frame with ratio 1 to 1 for the model and completed the work with wire along with the curve

3. The created product was to bundle with the frame and complete in the table format and create movement similar to vine
4. Attach bamboo and bundle with rope
5. Manage details for completion and move to site for installation

Approaches, skills, and methods used to create patterns for the staircases were inspired by vine, trees, and nature compared to life of people that are up and down both in terms of professional life and living. So it is suggested to live life with carefulness, commitment, and determination, patience, and diligence to ensure that you can be responsible for self and others that are dependent to you. The creation of work from handicraft to transform solid ground such as huge metal frame and concrete area with the decoration to make it softer and tender. This work is useful in giving the colorful features of life.

#### 4.3.9 Betta Fish Knotting



*Figure 131 Betta Fish Knotting, sketch design*



Figure 132 Betta Fish Knotting, sketch design

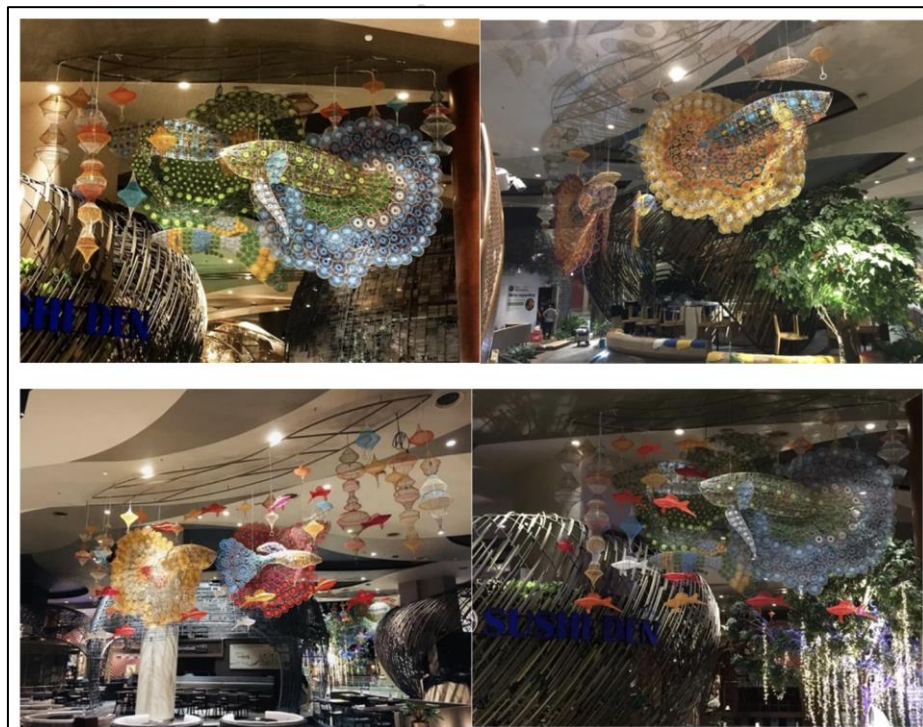


Figure 133 Betta Fish Knottin

Ideation to create this product to decorate the walking hall is the hanging sculpture that is light weight and colorful which is nice decoration piece of work. This piece of work was inspired by betta fish by looking particularly at their tails that can create colorful and nice illumination in the open area/ space. This was made with the technique of local fishermen's bundling techniques and meditation knot and with the completion with bamboo jointing to be the prototype. Betta fish, molly fish, and guppy fish are used as the guideline of design creation. This was used

to decorate the walkway that serve and guide or eye lead that reflect Thai culture that relies on competition and living with the simple life style to create nice and remarking lighting and shading.

Techniques to knotting and bundling of the fishing nets are used to instructed to the villagers in creating rattan the rolls outwards and inwards to the center with these following steps;

1. Completion of work, first, needs to understand proportion that contributes to the space management and also to manage the decoration components to fit proportionately.
2. Working to create the 3d draft in the computer to check how the hanging dimension should be created for different dimensions
3. Steps are to create the betta fish frame with the wire and bundling with silvered bamboo and complete with hooking as indicated in the picture of betta fish and guppy fish
4. Steps used to create colorful patterns by the instructors that make calculation to ensure precision and correctness as per the designed one
5. Trial with complete work and hang it to the place to ensure balance
6. Installation was done during the night time when the department store was closed.

Approaches, skills, and methods used for designing of the betta fish product was with bundling with colorful ropes which can be mixed by the seeing of color and used the shape of fish to be inspiration of such creation. And the bag used for catching was also created for additional decoration.

This product when completed will be very eye-catching and colorful because the ceiling and wall are black and grey. The work was mostly painted with dark brown for decoration of the areas that give a good contrast. The context of the design to create betta fish shape indicated well the Thai traditional and culture. The completion was done with color—waxed ropes to give contrast strong colors to attract interest.

When the work was hung in the open areas like halls with good order with high and low layering, this can be guideline for the working team as the hanging process requires good handymen that know how to work on the high ground and as the scaffolding has to move around in the rough surface areas, this requires effort to move this back and forth. Up on completion of the work, the work will gain attention from the audience if the work is decoration in the coffee shop or cinemas.

#### Benefits

1. Betta fish work creation that was used in the areas in the department store, the project benefits from using the design that was concept in creating the local fishing nets and spend time during the day when they are free from harvesting. Creation of such work gives them extra income.
2. The work even though takes relatively short time, however, requires a group of working ones that have free time from harvesting.
3. Working will have to be mixture between team with specialists, namely; smith, rope smith, installation team and logistic team as

well as the distributors and suppliers that can generate work to the community.

4. Working of this project allows to understand how to work systematically with patterns and plans given the short period of time in implementing the project. Given this, researcher learned to give the reasonable time slots as well as distribution of work to create work with the limited resources and time.
5. Newly learned skills and techniques to apply such work in the contemporary patterns that were applied in the department store helped generate income as second job from agriculture.
6. Working on design depends on market and opportunity so this can be immediately implemented and job can be created for communities

#### 4.4.1 Pavilion 001

Ideation in creating of this product and design was inspired by the shape of pumpkin to create good memories of the open space and characteristic. This was done by framing with the shape of pumpkin and the seam of each metal parts are completed by welding and bundling with rope to soften the toughness of the pumpkin. The bundling technique used bundling techniques of Chula kite or puffer fish kite with the specific hooking technique. Opting pumpkin was also based on the color of gold and as it is commonly known vegetable that is vitamin-rich. As the decoration of this product will locate outside the building, the moisture protection substance has to be applied. As the size of the product with the dimension of 10x11x7 m was quite large so the work has to be planned carefully applying different bundling techniques being specific of spaces and slots.



Figure 134 Pavilion 001, concept design comparing

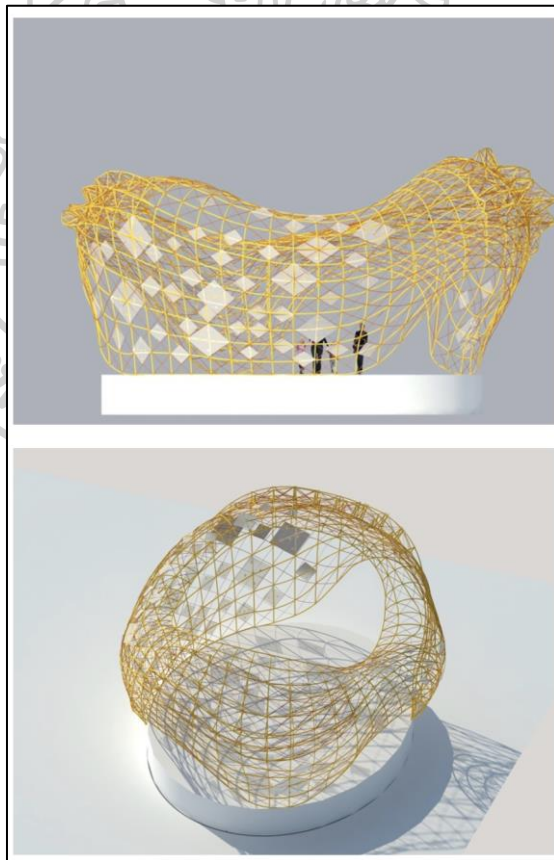


Figure 135 Pavilion 001, sketch design





Figure 136 Pavilion 001

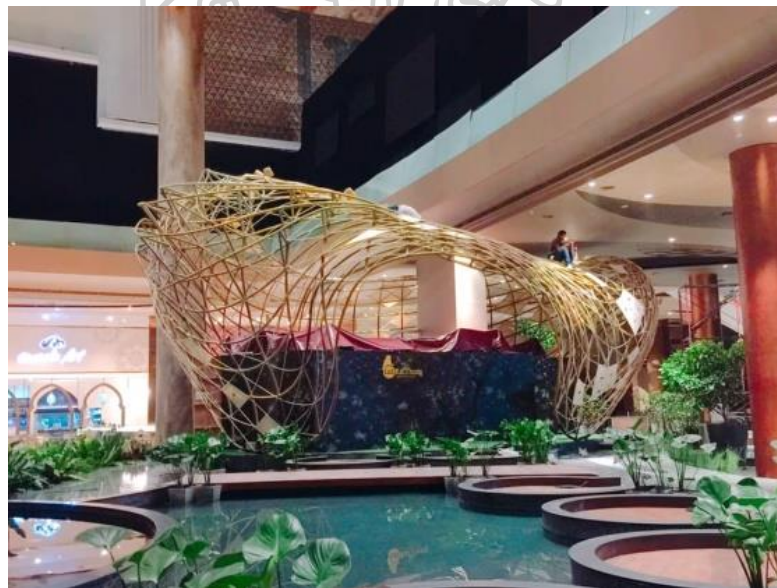


Figure 137 Pavilion 001

#### Techniques

1. Finding the shape that give inspiration first and then start with designing model to understand materials in either pattern in 3d dimension

2. When having the shape that wish and model, computer was used to calculate the ratio to place this product in the pavilion
3. Design with suitable techniques to respond to the air-conditioning system and the water pipe system as well as other facilities. The design should be done that allows to have good patterning.
4. Cutting the pieces of work and moving to other different areas, the moving lift is required and the product has to be fit with the dimension of 3x6x3 m. The product was knocked down first before putting together in one big piece.
5. In installing of the product, it will take time and need handymen as the pieces of product is huge. The process will need heavy tools and material.
6. Design has to be well taken care as parts of handicraft work has to be cut in pieces first and then bundling together with hooking technique that was previously agreed. Working of rope with metal frame will have to contact installation staffs on-site and to ensure the flame will not impact the work.
7. Having finished with welding will allow to complete the work with roping
8. Clearance and complete the venue

Approaches, skills, and methods used to create the decoration piece of pumpkin-shaped food court decoration was inspired by foods and nutrition as well as Approaches, skills, and methods the abundance of Thai fruits. The color of pumpkin in yellow and golden was outstanding with the metal and rope technique to create flow and nice movement. The mixture of decoration pieces in good proportion makes this product

very nice. As part of production, it deals with the industrial materials so these followings are steps taken;

1. Design process consists of 3 steps; data, draft and modelling
2. 3D work was done with the computer
3. Design will have to take into consideration of the facilities system in the building to ensure that it will not overlapped.
4. Design of pavilion in the department store was beneficial because there was no need to build roof to cover the piece of work so the selected materials can be natural and when working to install the product can be done with nice temperature.
5. Working in the department store will have to be efficient as there was only a short period of time and time slot for work to be completed. As working requires different groups of technicians and craftsmen so it has to be well planned to ensure the final product gives impression to the audiences.
6. It is believed that with the nice and good quality of work, it should give characteristic to the place and beneficial for commercial purpose.
7. Product was designed for nice lighting and shading of the objects which was part of the technique used for the work
8. Working in the project requires collaboration from many parties which can result in tension and stress to ensure that the work covers all details that were planned in the designing process. The process involves architect, welding, smith, roper, bamboo technician, controller, owner of the place, security personnel. There

are a number of formalities to be done as well as documentation. Therefore, there were a number of steps, such as; training and workshop to be given to ensure health and safety- as the safety is the most concerning issue.

9. The process of work will be easy and harmonious if we work on the agreed approaches and good reasoning. The project should be strictly relied on problem-solving approach rather than emotion.

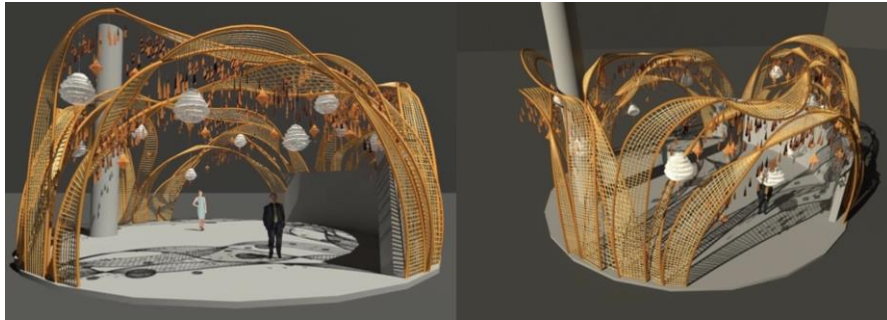
Working to create the massive piece of decoration arts requires good skill in coordination and logistics to ensure safe and reliable transport of products. After arriving on the site, the formality in the installation process was also important.

#### 4.3.10 Rice pavillion

Ideation in creation of rice pavillion was inspired by rice in the rice field as well as the ears of rice was used as inspiring part for creation. He perception and feeling received from seeing ears of rice was the humbleness and color of gold for the group of people. Researcher used the ears of rice as the model, however, reduced the size to make it the modern feeling. The placement and installation of work will have to take into consideration. The positioning and placement were referred to the positioning of stars in the sky in July. The rice planted in July was the best period that give moist that was represented in the decoration of the pavillion.



*Figure 138 Rice pavillion*



*Figure 139 Rice pavillion, sketch design*



*Figure 140 Rice pavillion*

#### Techniques

1. System suggested that the area should be 10x10x6 meters in the land of fertility
2. Ideation of the work, drafting, and modeling was prior done with 3D.
3. Creation of work that has the curve shape must be installed on site should be created outside and transported to the site. This will facilitate the work and the other teams to easily complete the work.

4. Formation of the work was done at the factory with the 1:1 ratio aligned with 3D design. The part of product was transported with trucks to the site.
5. Installation of the pieces of work, the work has to be supervised by the engineering team to prevent potential health and safety issues. During the working process, there should be discussion in terms of progress and obstacles to be managed.
6. The discussion with the engineering team will relate to safety issues and there should be discussion to ensure that the problems and other issues are mentioned.
7. Working process will face obstacles all the time during project, discussion and dialogues will help mitigate risks and expectations that can be different among people in the large-scale projects can be aligned to ensure good project flow and movement.

Approaches and skills used for decoration work of the ears of rice were inspired by rice which used this product to decorate food stalls and area of food court with metal frame and the completion with natural materials, bamboo, and rattan. To represent the pavilion with the look of nature and handicraft. This is believed to have created values, beautifulness, and differentiation that comes from making use of the work piece. How the research differentiates this from the previous handicraft was done by using natural fibers to bundling together with the completed frame with strength. The completion of the work was done with welding for giving strength and to be easy for cleaning, and with the health and safety concern.

1. Work is clearly exhibit and create more value from the added decoration such as lamps made by hands by bundling with natural materials. The product gives good impression to the audience.

2. Values of working with natural materials can be increased over time. Working with natural materials can be relatively slower than the industrial products.
3. We will have to think in advance to prepare natural materials include those that will be used on-site.
4. Materials thinking and design are very important process as they have to be fit with prepared frame. This has to be considered in terms of sizing and proportion. The lines as well as mood and tone of products are the key composition of the products too.

#### 4.3.11 Rice Field Hut pavilion

Ideation to create Rice Field Hut pavilion was inspired by the building that locates next to the rice field. The work starts with the creation of metal frame and then covered by bundling with bamboo, knotting, and bundling and complete the work in detail. With the color of bamboo that resonate golden color, it makes the pieces of work eye-catching for food zone of the department store that resonates the contemporary feeling of the product. Giving the product gives the sense of modernity, it can be eye-catching and gives the touch of Thai skills set and handicraft. The people in this generation can take advantages from seeing these designs for using in their own work.







Figure 143 Rice Field Hut pavilion model



Figure 144 Rice Field Hut pavilion model



Figure 145 Rice Field Hut pavilion on set up process



*Figure 146 Rice Field Hut pavilion*

Techniques used for development of this product include these followings;

1. Measure the areas that will be used for the formation of the frame as per the brief
2. Creation of the work by drafting to create the model using the curve material align with the shape of bamboo
3. Creation of work by studying model and implement the project with the 3D techniques will give value to the work and will not need to be fixed later in the computer but only by creating program to be used that linked with the professional demand. The computer will be very useful to adjust dimensions with engineer and architect.
4. Selecting right materials are most important part in the design process and using the computer to work on size to make it in good proportion. The design concept when using materials like bamboo will be different from the normal line drawing. Because using of

bamboo line will create dimension and make this work interesting for the audiences.

5. Putting system in place is the project's key success factor for project management as it deals a lot with humans. The step that deals with tools and heavy machines in the transportation procedure that would require to be careful for different types of prepare materials. Understanding proportion is therefore very important.
6. Having planned the working process in advance has made the process very easy and effective. The planning deals with coating with rustic prevention substance and framing with metal. Completion of work to clean up is important.
7. In completing the work, bundling for each areas needs good calculation for the amount rope and amount of bamboo as well as piece by piece equipping.

Approaches, skills, and methods used to create the Rice Field Hut pavilion was inspired by the place where farmers rest after harvesting time. The work was created with the metal frame and bamboo ended with rope.

The wok was mainly done with industrial process and ending with the handicraft to give the character of natural materials. Friendliness with nature and environment was moved to department store for commerce.

1. Decoration with bamboo gives different perspective for decoration along with the decorating system in the department store. The creation of housing with local materials has helped generating values to the area.

2. This was the way in leveraging the countryside and locality by bundling together things to create touch of modernity
3. This is to create job for the community by technicians and smiths that utilized the technique of bundling of fishing nets or furniture to generate incomes for self and for the household.
4. This is to create confidence and pride to the people living in the community to create the mix of locality and modernity.
5. Smiths and Technicians can create income and earnings for themselves by utilizing local wisdom that has been accumulated from ancestors. The knowledge and wisdom used for rope selection, technique to search for bamboo, and knowledge used to sharpen bamboo that contribute to the modern design.

#### 4.4 Replace Material

##### 4.2.4.2 Alternative material for product development



*Figure 147 Fabric*

Fabrics that were synthesized and weaved or woven to be completely done such as cotton, silk, and nylon, etc. The benefits of fabrics are to be used for cloth cutting for apparel and fabric-made furniture and other related stuffs such as; venue decoration, and etc. Main fabric materials were made from animals, plant, and chemical synthetics. Historically, making of fabrics has been around 34,000 years B.C. Fabrics were used as the proof of history. Nowadays, the quality and size of fabrics will be specified by factories but the weaving techniques and pattern of fabrics are the heritage from the past and modernize it to create contemporary touch.

Fabrics can be used for many benefits and purposes. The most common usage of fabrics is with the cutting of apparel and to create containers, such as; bags and baskets, etc. In addition, fabrics can be used to produce home products including curtain, bed sheets, towels, and etc. This includes the using in science and industrial work by using the condition of the fabrics specifically for their purposes.

In the industrial sector, there were apparels that were specifically created that was fit for purpose, for instance, the especially thick suit for car mechanics or suits for fire fighters that were fireproof and the medical suits that have special condition to prevent infections, etc.

Materials used in production of fabrics composed of different sources;

6. Animals- materials will come from their fur, skin, and fiber (pupa) from sheep, goats, etc. The final products are such as sheep fur coat and silk coat.
7. Plant- materials include pineapple fiber, cotton fiber, etc. The final products of these materials include pineapple fiber cloths and cloth for infants.
8. Natural minerals- the product uses the mineral fibers such as asbestos, basalt fiber to create products includes doors covering

cloth that is very durable and popular for use in foreign countries to prevent scratches from animals

9. Synthetic chemical substance that was created by chemical process

Findings from the working and design process in the practice-led approach were that when the material lines moved when implementing the project, it can be contradicted to the sketch, and plan and the project imagination in the early state. The hand sketch was then required to fix such problem of the model to respond to the changing context of the working reality. This, however, still had to take into consideration of the history of arts that was the background idea for designing or the design of line.

Understanding of materials, such as bamboo and weed, is required especially for designers to find solution and find the most possible way to use the materials in the most effective way. To elaborate, coloring to match with environment, design of shape, and spacing that is the key charming element in the design process that presentation with pencil during sketching cannot realize. So this is the back and forth process of pencil and prototyping that creates the mutual learning and adaptation until the end of the research that makes this dissertation interesting.

## Chapter 5

### CONCLUSIONS AND RECOMMENDATIONS

Bundling is the simple basic skill that reflects locality. All lives should have experienced rope bundling. Technique of rope bundling can be very useful and creative with ten different bundling techniques. Study of Chula and puffer fish kites bundling, study of local fishing nets bundling, techniques for basketry bundling for furniture and technique for animals catching tools that are the basic techniques that come from ancestors. The technique to frame furniture and create household appliances can be basic technique to be leveraged for other contemporary household products. Invention and decoration work including wall and ceiling work, façade and pavilion have been done according to this.

#### 5.1 Practicing to understand the technique

To practice bundling technique, the key issue is bundling that does not create complication. It is the combined with the sharpening of bamboo, bamboo selection in the areas as much as you can.

#### 5.2 Learning from practicing

Experimenting and practicing create experiences and skills and serve as foundation for the implementation. After time to time repetition, the practitioner will understand details in different natures of materials, bundling and tying techniques, selection, sourcing, brainstorming, and problem-solving that results in endeavor and patience, as well as confidence.

Confidence gained from practicing and working in the areas of expertise can serve as occupation. So this is particularly important for the modern time that we should practice until we understand the process and can be instructed to others for any different contexts and capitals provided.

When we practice much enough and graduate, we should be able to demonstrate to the society that what we have learned should be useful and

adaptable such as via selling of product or implement the project with other to share the true value of project and work.

Contest is considered as one of the ways that help realize and come up with the real experience to come up with the eye-catching technique of bundling and using of work in functions.

### **5.3 Leveraging**

In work, leveraging is always important as well as development and the creation through mixing patterns to ensure modern look. The mix of patterns to create contemporary feeling can be applied with other occupation. Wall decoration, door façade, or creation of pavilion or bundling techniques used in furniture and architecture work since laying ground to building based on artistic background.

### **5.4 Using of local materials that come from community context**

Designing of buildings that have nature different from flat land include rock, mud, water, sludge, cliff, trees or tower. Designers require to have experiences in their previous working process to gather useful data and information mixed with the skills of communities' personnel that would be useful for creation of work to come up with eye-catching and interesting experiences.

The examples that would be raised this time is the characters in the building of local houses of people living in Baan Lam communities that live in traditionally in the mangrove areas or areas with frequent sea rises- to be specific this is period between November to February. During the mentioned period, those visitors to Bann Lamp village will face the situation of rising sea level as it comes from the natural waterway attached the area of mangrove. The techniques utilized by villagers in Bann Lam that responds to the condition of the area, namely, using the technique of bunting in replacement to jar or larger water containers. The making of bunting was done with the usage of bamboo which is the natural materials that can be easily found. This technique can be utilized for the whole life.



Using bamboo for the construction of the housing structure on the mud area is the key technique by making bamboo in cylinder shape with the space inside that makes it float on the river. With the slant cutting, the air comes inside the bamboo so bamboo can be useful as water containers in replacement to the jars. The bamboo is forced into the mud and in one spot can be from 4-8 bamboos called Kone Sor bamboo which will be above ground for 3-6 meters. Putting in the bamboo is easy step but taking them out would be very difficult as the mud will be very sticky with the condition vacuum. Another technique using vine or rope bundled in vertical and horizontal direction to wrench or knotting in cross direction. Replacement of the broken will be done by replacement. Or addition to the existing is option to ensure strength.

Bamboo that is used for this can be fresh bamboo when attached to the frame in the seawater area. Leaving these bamboos submerged in the sea for months would help stop rotten process of bamboo and the natural process enhances the condition of bamboo that would last for life. Constructing the house structure will be made with simple bundling with a number of bamboo to preserve the condition of bamboo to last. The area opted for house construction is mostly an open area that was prepared for multi-purpose. The living condition of villagers such cooking in the traditional way with smokes and smells but with the natural ventilators. With this, it prevents bugs and flies. These techniques are local wisdoms that have lasted for generations.

The construction materials used for house construction in the areas attached to sea sides that are mud in Bann Lam area are bamboo with the ripen/fresh color at its age of 3 years and bundling at different spots to give strong attachments, especially the areas that are challenging, namely; with waves, winds, and all-time movements. Bamboo sticks can be very flexible with joint connection that will be seismic proof and not fragile. Bamboo is therefore very useful construction material as these following sayings;

"..... Identity is not that important as equal to pride

.....An identity might not be as important as one's pride....."

.....Mr. Suwan Kongkoontian 2520

Victor Hugo, known French writer and playwright of the Romanticism in 19<sup>th</sup> century, stated that the true beauty does not rely on metal or material or construction or even on its own. The beauty rather is in the eyes of beholders. Researcher sees beauty from the surrounding context such as rose apple that does not only taste good but also that it has function and its form.

### 5.5 KORAKOT ECLECTIC MODEL

KORAKOT ECLECTIC MODEL is the summary of the knowledge that I can deduct from this PhD thesis. It is the finding that we should not attach to the past but rather learning and understanding the knowledge of that time and the way they perceived. The development of Local Traditional Handicraft that resulted in Modern Contemporary Product Design requires the basic understanding of aesthetics and history of arts combined with comprehension of nature and its context.

Eclectic believes that we should not be attached to any sets of ideas or knowledge for designing. The work of this thesis has mixed the remaining thoughts in the past. The study of the past is not attaching with the past but understand the way they saw world at that time.

KORAKOT ECLECTIC MODEL is the concept that we do not attach with style or fashion of particular timing. The behind conception of this is based on the design that takes different features of things, natures and surrounding contexts and patterns for decorations with shaping, color, composition to come up with the prospects to create beauty and suitability focusing on mixing and matching.

Researcher summarizes these findings that designers of products can utilize the local wisdom for further development of contemporary style.

1. Knowledge and wisdom indicate the relationship between human and human and human and nature and human and wisdom. This is formation of relationship between domestic and ecologies.
2. Searching skills in the areas, communities, or local context which are personal skills that were gained from experiencing, observing, or by talents that can be communicated over by written language or mathematics. This is required for the design process as well as continuous development of local wisdom to improve the design work.
3. Form is the searching and investigation for interesting patterns or shapes that were inspired by nature. The formation of nature and the patterns that are similar to nature are the ideas that can be useful in every context. Design with nature basis with adjustments or adaptations can be useful but not taking the full form of nature. The skills in observing surroundings and natures are useful to be utilized in building and house construction.
4. FUNCTION is the study of consumers' behavior and understand the needs of users and defines users' experiences to respond to the need that would prove the success of the products.

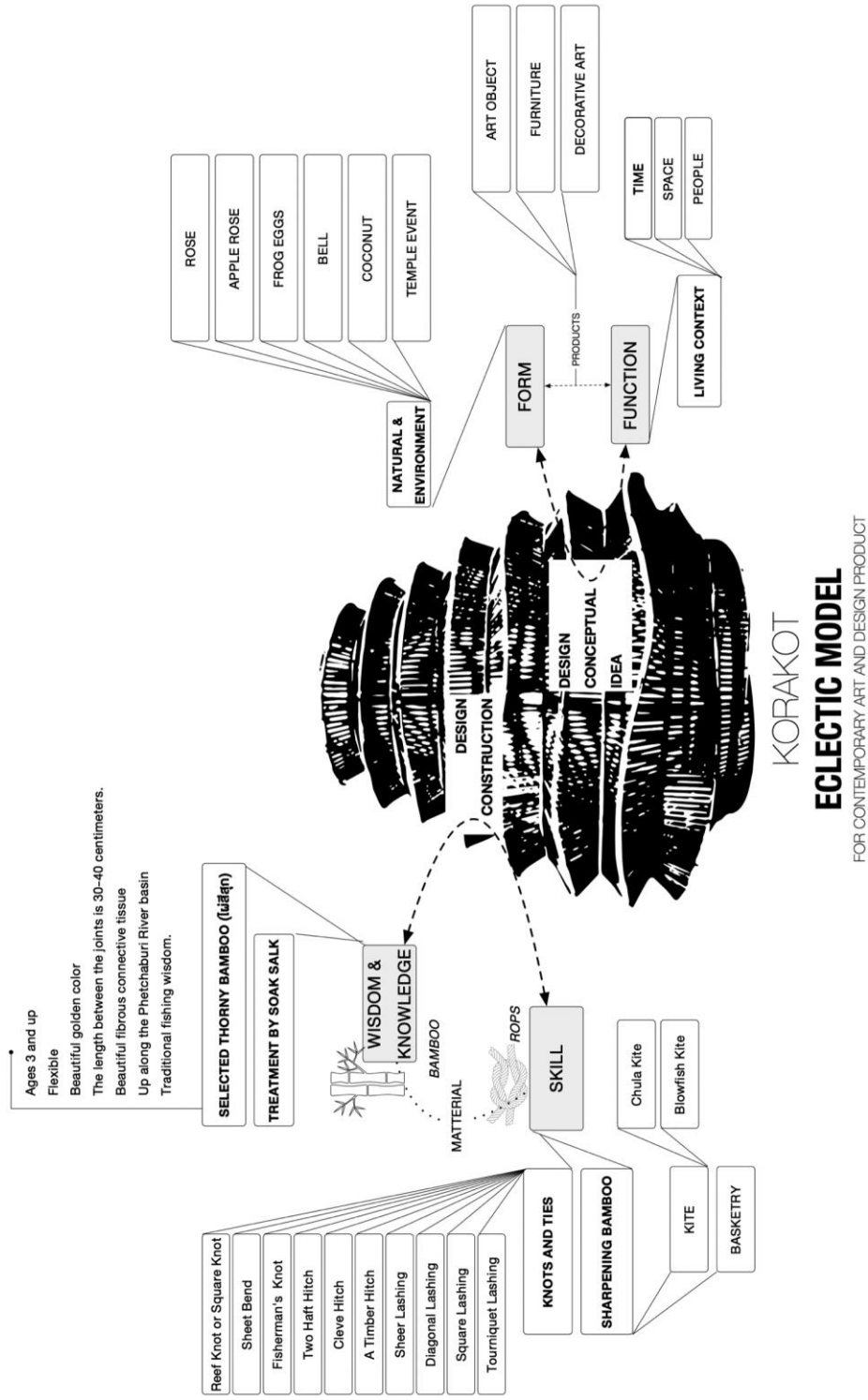


Figure 148 Korakot Electic Model

From research for data and information, researcher can study, understand local wisdom by exploring and study from the tales and experience through daily living. Interdependency and abiding form of living were believed that there were tales of pf stories and ritual that were embedded in the local living wisdom and process in the community of Bann Lam. The research looks particularly into the livelihood of the fishermen and particular ethnography through observation and interviews from the reflection and appearance. This can be reflected from their handicraft with bamboo and rope.

This characteristic appeared in the local handicraft that reflects local culture of daily bundling for living, such as; local plays like Chula or puffer kites, basketry that is used in for domestic living, baskets, threshing basket, dish cover, and animal catching tools. This includes the making of fishing nets. Researcher analyzed this to understand identity of local of using rope and bamboo coming up with 10 different bundling patterns and the light-colored bamboo.

In addition, all the designs in this research, researcher found out one thing in common that contemporary bundling and knotting can be applied and used in various aspects. Therefore, this requires skills, workmanship to create jobs in the communities that contribute to income generation and enhancing capacity. Opportunities giving the local people create jobs for fishermen that can create fishing nets for decorations as well as decoration and architectural work done to the sites. This should be leveraged and be considered as the pride of the communities to lift up communities' economies.

## Recommendations

Getting back the sample in this thesis that was developed based on the local wisdom, this piece of work was part of decoration of “Kru Ya Rew restaurant” that indicated how the bundling and knotting were significant in the mangrove areas, namely; communities, fishermen, Pa Deng community in Kan Krachan, and Laos Song community in Khao Yoi. These three communities applied techniques and skills for the development of the projects as followings;

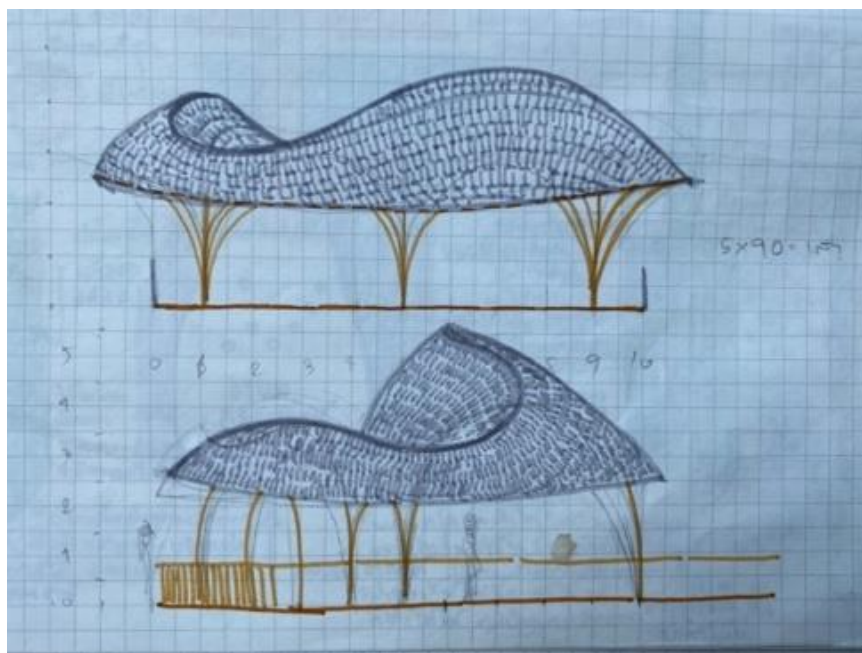


Figure 149 Kru Ya Rew restaurant sketch design

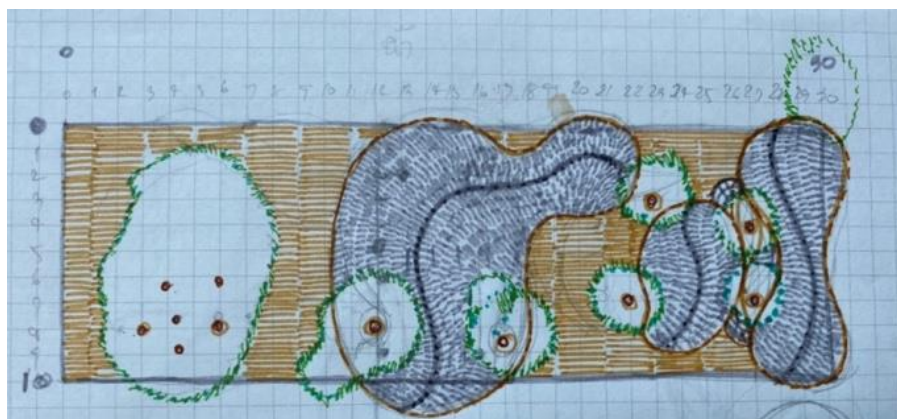


Figure 150 Kru Ya Rew restaurant sketch design

1. Knotting and bundling in the local fishermen's way are interesting with different styles, such as; wrenching, hooking, knotting, and bamboo joints connections that play significant role in structural work including utilization of bamboo and the fact that bamboo has to be submerged in the seawater for over two months. Preparation of bamboo prior to the usage in the seawater, there must be a making of punctures for the whole stick to use the seawater to react with flour and sugar components in the bamboo.

2. Bann Pa Deng community (Pga K'nyau Tribe) living in Kankrachan having lived in this area for long time also utilize the technique of bundling and knotting. Research conducted sites visit and could see that they built houses with bundling technique and make it airy and spacey with all the living functions in one place. It is even more special as they can cook inside the house with coals which results of it can be prevention from bugs and flies. Maintenance of the house can be done by cutting out the ropes and knotting again with the new bunches of bamboo. Multiple bamboo poles help ensure the stabilization of the house.

3. Thai Song Dam or Laos Song in Phetchaburi province has lived in Phetchaburi province since Krungthonburi era and migrated to live in Khao Yoi district. Seeing local skills has interested researcher to explore further. One of the observations is the curve of roof that was made by sharpened of bamboo to be used to decorate roof frame make a nice look so decided to use the case for Kru Ya Rew restaurant.

4. Ideas were made from seeing and understanding the community's local context by using the mangrove areas for project development without any deforestation only clipping out the branches and finding space to create walkway and poles. Bundling of bamboo was made by the remaining of ropes from fisheries with hooking techniques called Yai Joong Larn knotting.

5. When bamboo was submerged into the mangrove mud, water will permeate in the bamboo membrane.

6. Bamboo has its breathing function when contacts with water or rain, bamboo will swell and will shrink when in the sunshine.

7. Bamboo will face with wave and wind meaning that bamboo will curve, be flexible when contacts with waves. So, bamboo is the material that is very climate adaptable.

8. Rubber band that is used fits well with bamboo with its flexible condition. Because this particular rubber band has its flexible feature. Making of roofs with internal rubber band was made with double sheet bend. Researcher, therefore, uses rubber oil, resin, and mortar mixed and enamel it to preserve the condition.

9. Mixing that was mentioned was used for the making of Yah Rew restaurant that is 100% bundling creation. This has enhanced the local skills of the villagers and to be proud and used in daily life.

10. Skills using and bundling with rubber band can stay in the community that will not lead to stain.

11. Bamboo product is suitable for the community that it like airy and wind flow condition. Therefore, mixing of bundling techniques with Laos Song technique and cross knotting of Pga K'nyau Tribe is good and durable.

12. Bamboo structure helps create work for teenagers and good for exercise.



The design and installation works developed from the body of knowledge in the thesis.

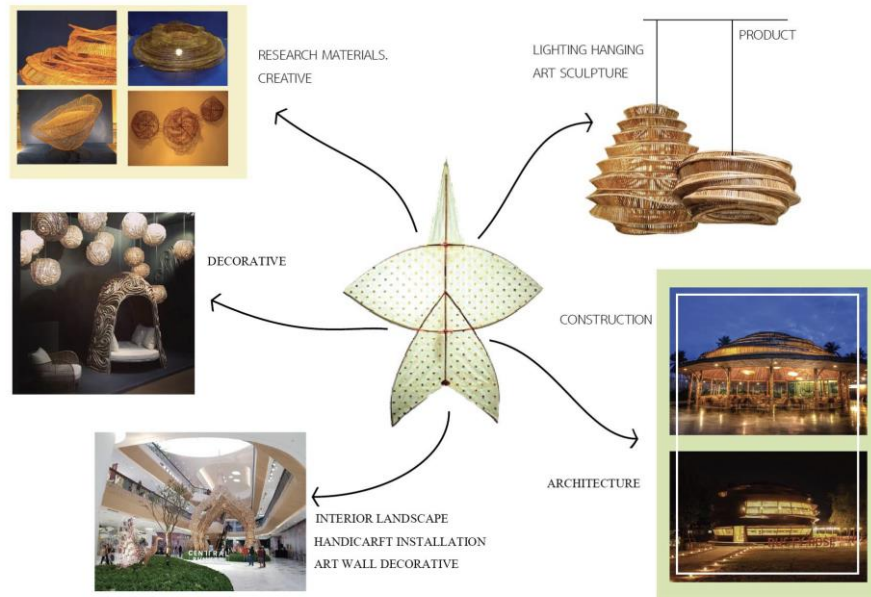


Figure 151 The design and installation works developed from the body of knowledge in the thesis.

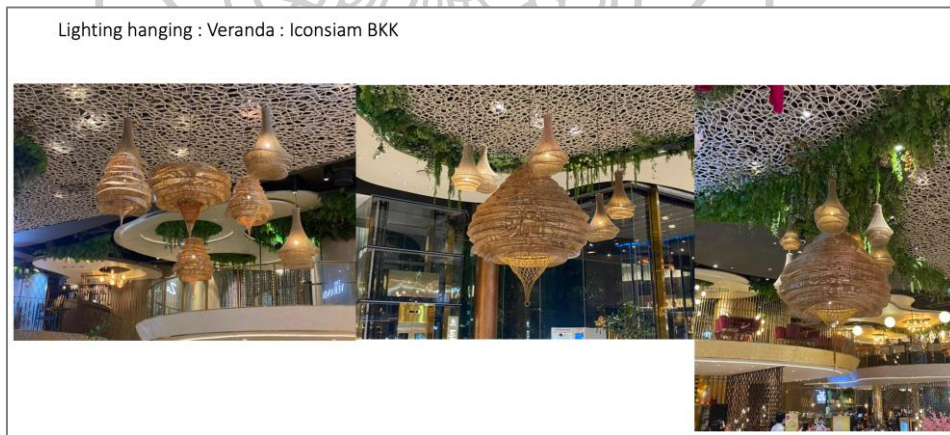


Figure 152 Lighting hanging



Figure 153 Bamboo



Figure 154 Korakot Products



Figure 155 Korakot Products

Furniture Dinning chair



Figure 156 Furniture Dinning Chair



Figure 157 Armchair



Figure 158 Armchair Poka Dot



Figure 159 Korakot Table 02

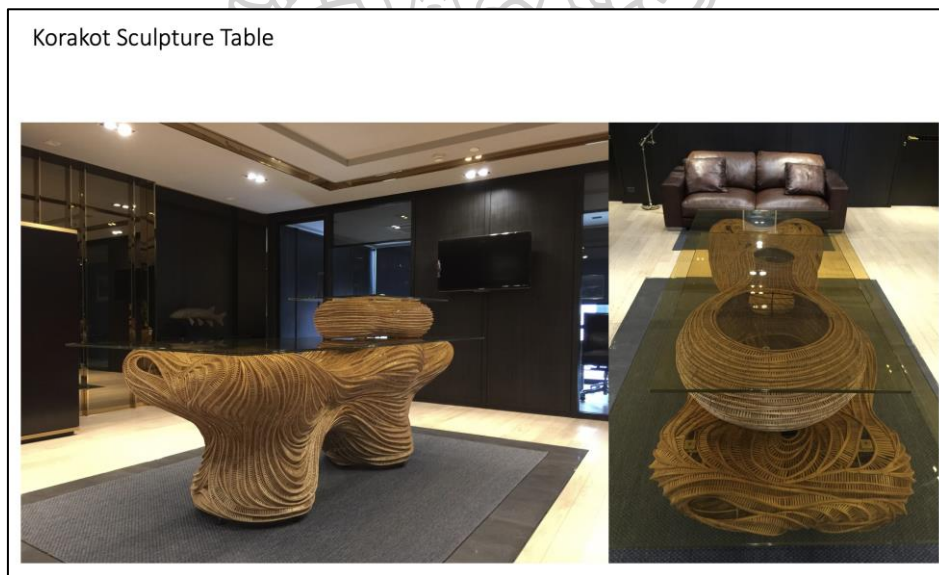


Figure 160 Korakot Sculpture Table



Figure 161 Korakot Dots Counter at Iconsiam Bangkok. Material Bamboo and Ropes

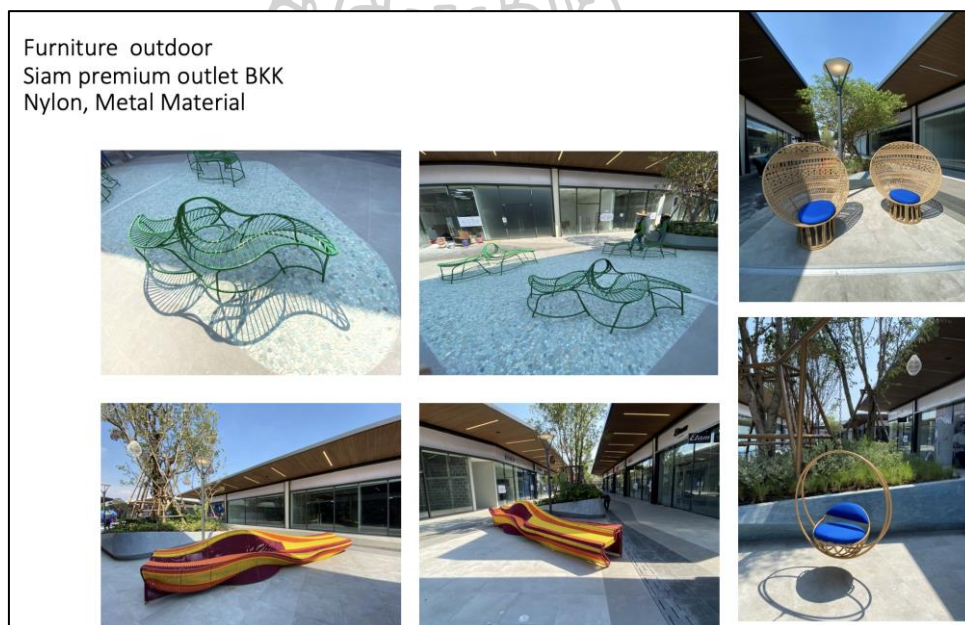


Figure 162 Furniture outdoor at Siam Premium Outlet Bangkok.

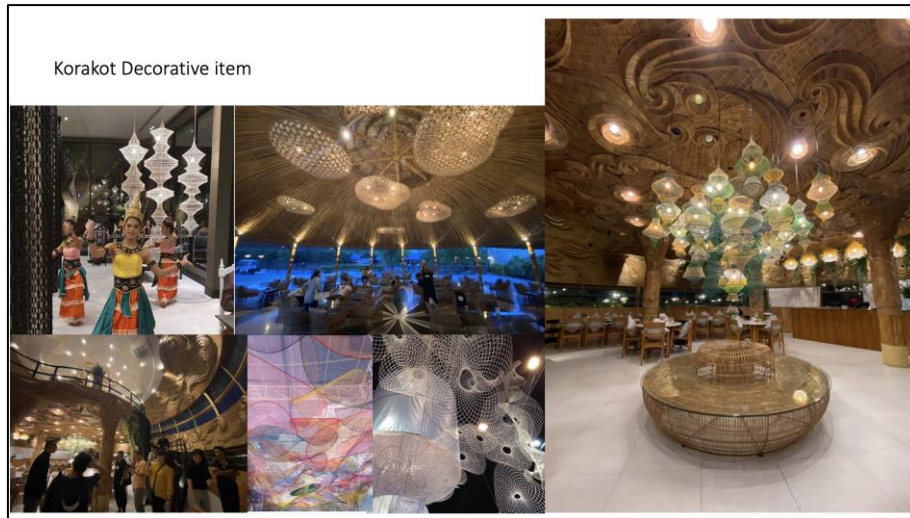


Figure 163 Korakot Decorative Item

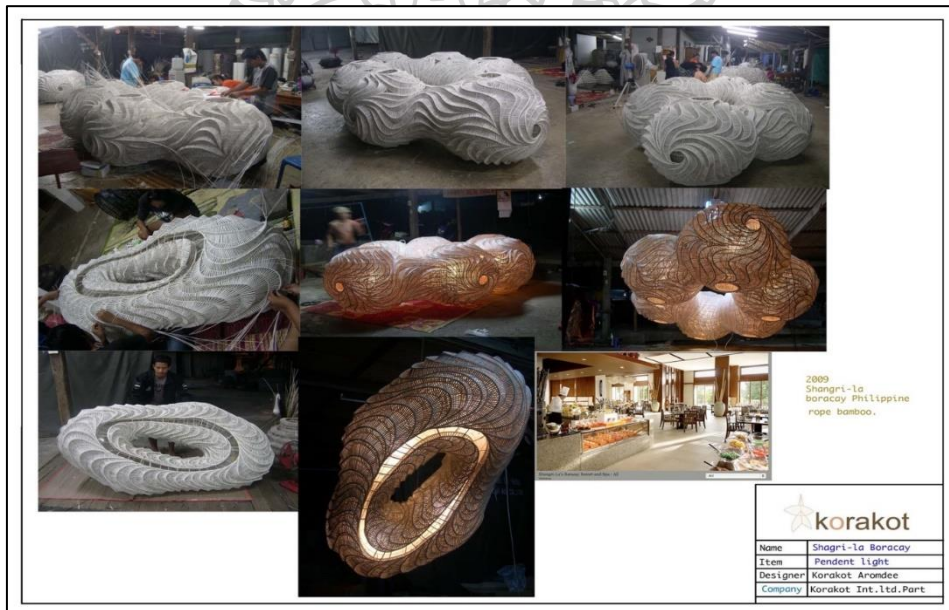


Figure 164 Shagri-la Boracay

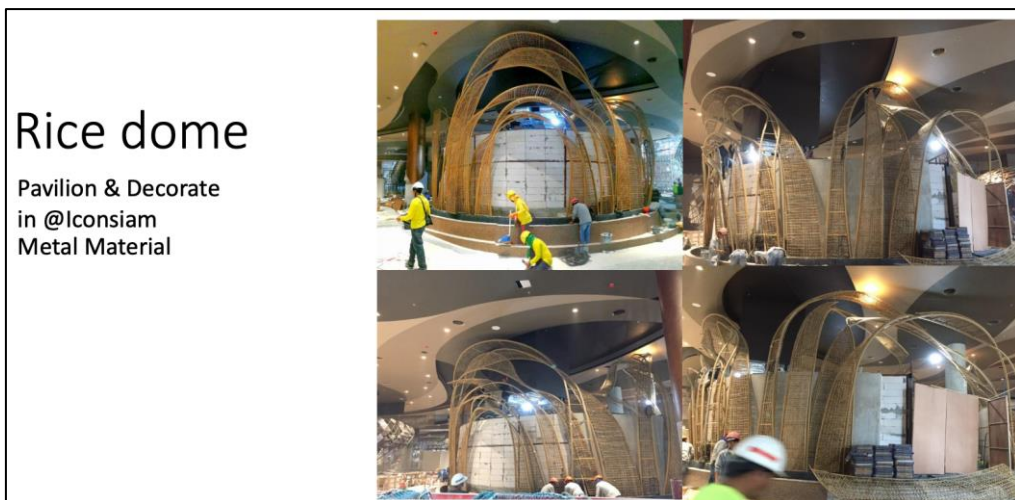


Figure 165 Rice Dome



Figure 166 New Year Fashion Week





Figure 167 Spring Field Resort



Sculpture hanging Deco in Hotel  
Bamboo Material

Figure 168 Sculpture Hanging Deco in Hotel

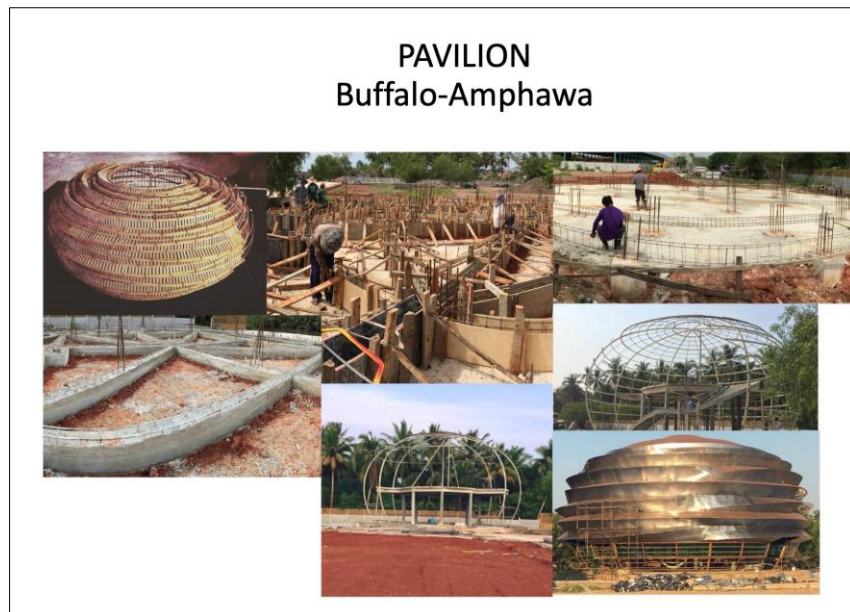


Figure 169 Pavilion Buffalo-Amphawa

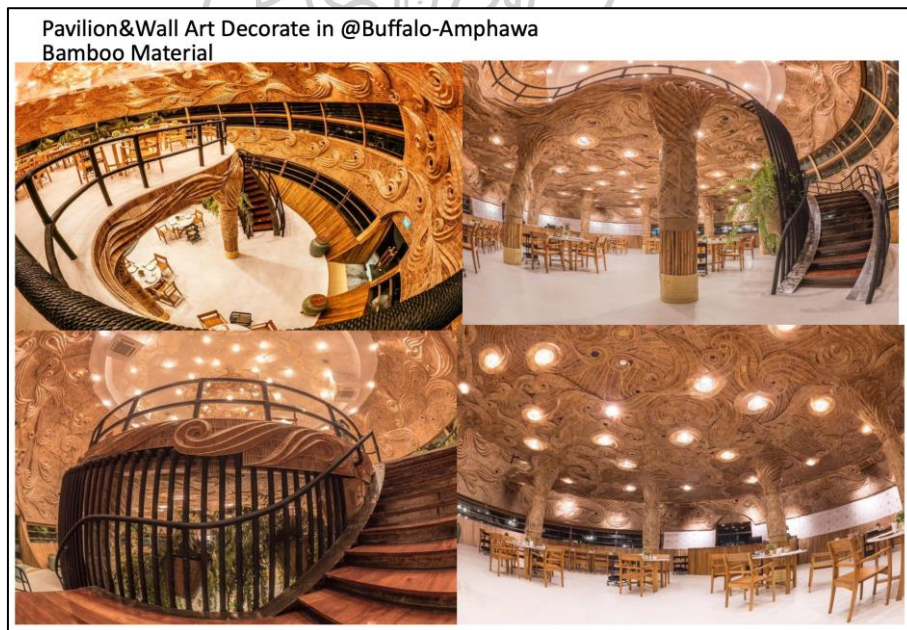


Figure 170 Pavilion & Wall Decorative in Buffalo-Amphawa Bamboo Material



Figure 171 Architecture Decorate in Kaomai Plamun Restaurant, BambooMaterial

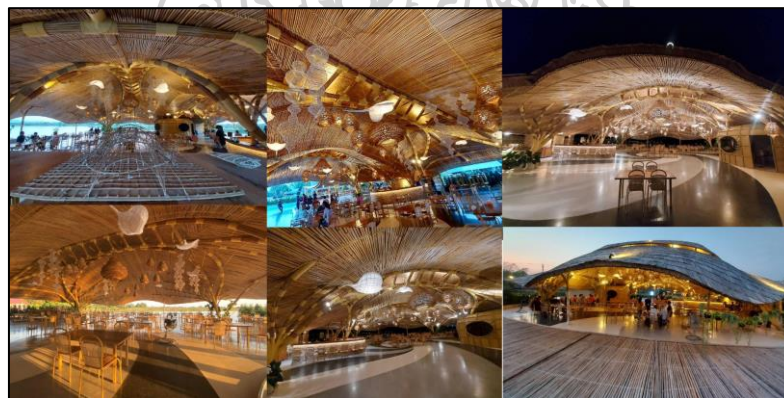


Figure 172 Kao Mai Plamun Restaurant

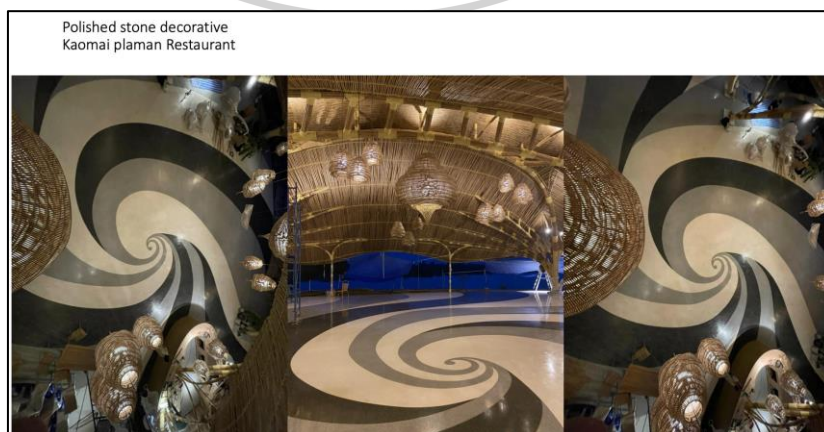


Figure 173 Polished stone decorative

### Conclusion

Benefits of utilizing of local skills is that constructors can easily talk to the handymen easily with symbol. With the large open area and space, the area can be used for many activities, camping, restaurants, tourist spots, to stop deforestation in the mangrove forest. This will also protect aquatic animals' nursery in the area.

Visitors to this area will have opportunity to consume fresh seafood. Fishermen boat with this style is good and very close to nature.

Working with local techniques indicates local wisdom that was repeatedly experimented time to time for bunting.

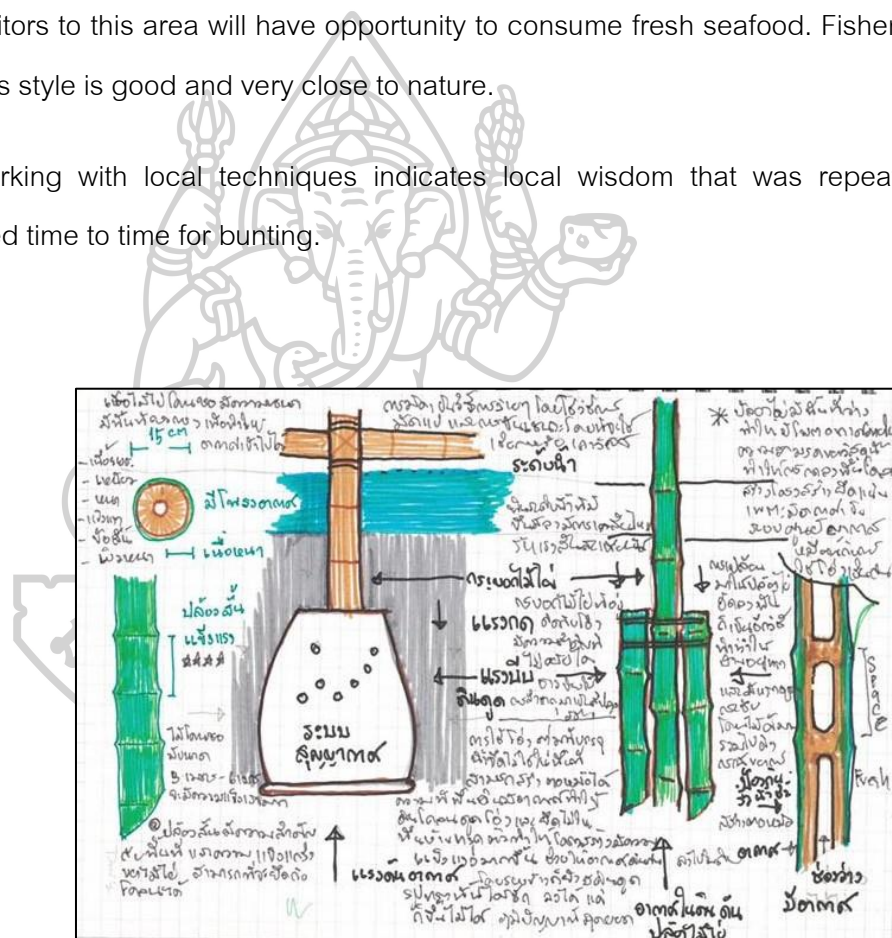


Figure 174 Foundation Pillar at Mangroven Forest

Fishery tools and kites are foundation in creating of bamboo work of researcher that later became 'KORAKOT' brand of the researcher. Number of world-class masterpieces like Hermes, Louis Vuitton that was used for restaurants, hotel, resort all

around the work decoration were inspired by the work pieces of local fishery and were exhibited in Maison and Object in France, one of the biggest design exhibitions worldwide.

Inspiration from local handicraft has made researcher to create bamboo work that has interesting characteristic from knowledge, wisdom, and understanding of material.

In addition, the research benefit also created jobs for the community by bringing the children of fishermen to Bann Lam to absorb in the ancestor's fishing net tying method, tying, tying in the blood of all fishermen. When people in the community come to work together, they have opportunity to see their grandparents since childhood, so they can adapt with the technique very quickly that result in income generation and occupation that helps preserve the old-time assets.

This research has indicated the linkage background of invention of fishing tools of the local Bann Lam villagers that is linked with community. The local fishery work in Bann Lam is linked with the local business of production of hemp rope in Bang Khun Srai that is used for the production of fishing tools and the bamboo is used to create pontoon that comes from Kan Krachan district, Non Ya Pong in the area of mountain range of Tranow Sri. The sellers of bamboo will create the pontoon with bamboo to the end of Petch river and buy the seafood on the way back. The takeaway from this is that the economic activities can well narrate the living in the history in an interesting manner

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## VITA

**NAME** Korakot Aromdee

**DATE OF BIRTH** 24 Jan 1977

**PLACE OF BIRTH** Petchaburi, Thailand

**INSTITUTIONS ATTENDED** 2021 PhD Arts Design (International Program), Faculty of Interior Design, Silpakorn University.

2005 Master's Degree, Faculty of Graduated School, Majoring in Applied Arts, Silpakorn University, Bangkok.

2000 Bachelor's Degree, Faculty of Fine and Applied Arts. Majoring in Painting, Burapa University, Chonburi

**HOME ADDRESS** 335 Moo 10 Banlamm Petchaburi 76110 Thailand

**AWARD RECEIVED** Honor Award

- ศิลปิน ศิลปาธร 2560 สาขา การออกแบบ
- รางวัลศิษย์เก๋งดีเด่น ม.บูรพา 2563
- รางวัลไทยสร้างสรรค์
- Design for Asia Grand Award 2008 HongKong

### Experience and Award

2021

- ศาลาธรรมสวัสดี หุบเขาโพธิ์สัตว์ เสถียรธรรมสถาน 2  
แก่งกระจาน
- Art Sculpture Hanging Central China
- Zone A Zone B Zone C
- Installation Art in Condominium office , Guizhou  
China

- Bamboo Building Na De Bangkok
- Bamboo Wall Art in Chongqing China
- Art Sculpture hanging in Thai Restaurant in NEW YORK
- Wall art sculpture Thai Restaurant Fedrichshafen Germany

2020

- รางวัลศิษย์เก่าดีเด่น มหาวิทยาลัยบูรพา 2020
- Installation Art in Sea Salt and light Festival , 30x30 Maters,
- Bamboo handicraft Entrance 6x70x5.5 maters.
- Art Decorate for 6 Gate Iconsiam Premium outlets.
- Playground ,public furniture Iconsiam premium outlet
- participaant in Maison and Object Jan Paris 2020.
- project Bamboo art sculpture at OZO Phuket
- project Khoa Mai Pla Mon Restuarant ,Amphawa
- Project Kruo Ya Rew Restaurant Bang Ta Boon.
- Project for The Mak , Koh Mak Trad Provice
- Main Entrance for Pranakornkhiri Festival Petchaburi
- Art decoration Zone G Paragon Departmentstore.
- Art Decoration lobby at Chatrium Hotel Petchaburi road.
- Art decoration lobby Bali hotel.
- Build a restaurant structure Kao Mai Pla Man Samutsongkram
- Build restaurant Structure, Krua Ya Rue Bangtaboon
- Build Entrance Structure for Pra na kon ki ri festival

,Petchaburi

2019

- PM award 2019 The Best Product
- DMark Award
- decorative item Prakad Iconsiam 6 fr.
- Decarative wall patition Hermes retail store Central

Phuket

- Art installation Bangkok Design week 2019
- Dmark Award 2019
- Project Kao Mai Pla Mun Restaurant Amphawa Samutsongkram.
- Project Prina hut Potharam Ratchburi.
- 1/ 10 Designers Bamboo Product for Qingshen Sichuan China

2018

- Art Decoration and Build Art structure at 6th flr. ICONSIAM

- Art decoration in EVA hotel and resort Pang Gna
- Build Art Sturture Architech rusty rose @ the buffalo amphawa
- Build Art Structure at Central Phuket
- Art decoration lobby Natural Phuket Hotel

2017

- รางวัลศิลปินศิลปาธร 2560 สาขาออกแบบ ศิลปิน

แห่งชาติ ไม่เกิน 60 ปี

- โครงการประดับ Art Feature interior landscape @  
Central MahaChai

- รางวัลพระมหาดารา เสถียรธรรมสถาน

- รางวัลยอดเยี่ยม 15 talent Thai กรมส่งออก กระทรวง  
พาณิชย์

- Setup Artwork at Junction city

- Grand Award 12 Asian Art and Craft design Award  
2017 by Sacict

- Art Lighting Sculpture for Egypt.

- Art Work at Rosewood Panompen Cambodia

- Art work at Rose wood Phuket Thailand

- Art work and Decorate item for Sixsense Resort and  
hotel Krabay Island Cambodia

- Art work at Sixsense Seychelles Island

- Art Work for Thailand Pavillion TICEF exhibition

Bacelona , Exhibition at Las Vagas and Exhibition at BKK

- Asian Wickerwork Art work and Pavillion at  
International Craft and Art Fair by Sacict

- Design Art work and Pavillion for Buono ,Tifrex food  
exhibition BKK.

2016

- Design and decorate in Ground floor @ Siam  
Paragon BKK

- Design and decorate art work @ Junction City  
Yangon Myanmar

- Design Art work for outdoor Cabana and Chandelier  
Resident house Jahor Bhalu

- Design and set up Hilton Colombo Srilangka
- Design Payann Restaurant Petchaburi
- Design Art work for Casino @ Genting Highland MY
- Design Art work and Lighting @ Leelawadee Thai Cuisine @ Chongqing China
- Art Decorate Bann suay Surathani Province
- Design Celling Artwork at Coffee shop at Krabi province.

- Art work for Thailand Pavillion at SIAL Paris France

2015

- Design wall art Restaurant Inniala hotel Phuket
- Maison & Objet 2015 Paris France
- Tiff fair 2015 BKK
- Installation Art handicraft with Thai soldier Exhibition at UNESCO NewYork USA

2014

- PM Award Excellent Award
- Dmark award Thailand
- Gmark award Japan
- Project Art Sculpture at Prana Resort Samui Thailand.
- Project Art Sculpture Installation CAS group Thailand
- Project Installation Artwork in H.O.T Fair 2014
- Project Installation Artwork in SIAL Fair PARIS 2014
- Project Wall Art at IBIZA SPAIN.
- Design Director Project The Buffalo Amphawa Hotel

2013

- Art installation for Ratchaburi Province,
- Grand Award , Product Design Innovative Carft in Sasict.
- Exhibition product in Salone Milan Fair.
- Project in Iniala Hotel Natai Pang gna.
- Project Lighting installation for Amari Hotel Patong Phuket.
- Art Installation in Casa de Lafrola, Kaolak Pang gna,
- Art Installation in Bumrungrad Hospital.
- Art Decorative item for Red Sea Saudi Arabia.
- Exhibition in Salone Milan Fair,
- Exhibition in Maison&Objet Paris Fair.
- Sculpture lighting for house in Kolarlunper Malaysia.
- Invited from Taiwan Wolrd Carft Coucil in Submit
- Decorative item for Siam Crusine Pattaya.

2012

- Art lighting & Decorative item for So Bangkok Hotel
- Art sculpture & Decorative item for Okura Hotel Bangkok.
- Art sculpture lighting for Fry Now office.
- Art Sculpture for Raffle Hainan Hotel .
- Art hanging sculpture for Rice Museum in King Rama 9.
- Art Decorative in KC Grand Resort Koh Chang

2011

- Art installation in Sasict

- Art installation in exhibition Thai health.
- Art Installation in Circle condominium.
- Lighting sculpture for Centara Grand Maldive.
- Wall Art sculpture for Dusit hotel in Maldives

2010

- Grand Prize Award in Thai Creative
- Grand Prize Award Ticep
- Grand Prize Award in Priminister
- Projetc in Sheraton Macou.
- Project in Raffle Hainan China
- Project in Slow hand Milan.
- Exhibition in Maison&Objet in project hall

2009

- wall art sculpture project in Marina Bay Sand Singapore
- Sculpture lighting inShangri-la Shainghai China.
- Wall Art sculpture in Casaurina Resort Petchburi
- Lighting sculpture Papau New Guine
- Exhibition in Maison & Objet Young Designer.

2008

- THE BEST DESIGNER OF THE YEAR 2008 ( The Best Of Product) SILPHAKORN UNIVERSITY
- Solo Art Sculpture in MeatPacking in New York Fashion Design week 2008 " tie the knot " 18 may - 15 june 2008 establishment 30 gansevoort street new york, ny 10014 Shangri la Resort& Spa Hotel, Boracay Island

Phillippine ,

- Café Zone. Art Sculpture Lighting Hanging
- Installation Lighting hanging Amari Hotel Phuket.
- Project in spring field. Cha Am

2007

- DESIGNER OF THE YEAR 2007, Silphakorn University.

- Talent Thai Big&Bih 2007 October

2006

- Art Exhibition in Amata Art 1st
- Art Exhibition in Toshiba
- Package Exhibition of Otop Thailand
- Participated in talents a la carte Thailand
- Maison&Objet Paris ,France,September 2006
- Participated the international exhibition Ambiente Tokyo, Japan,June 2006
- Consolation Prize, Make in Thailand Fair 2006
- Talent Thai Big&Bih 2006 April
- Talent Thai Big&Bih 2006 October
- Established Juristic Person In Name “ Korakot International Limited Partnership ”

2005

- Nation of Art exhibition 49t
- 1st Price Award OTOP DESIGNER AWARD 2005
- DESIGNER OF THE YEAR 2005 , SILPAKORN UNIVERSITY



2004

- Received Thesis Scholarship From Statesman  
Excellency General Prem Tinsuranon

- The First Runner Award, Honourable Mention Award  
ASIAN FURNIJURE FAIR 2003

