TEXNITURE
A freestanding functional textile object

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Abstract

The purpose of this thesis is to explore the possibilities to create freestanding functional textile object that involves the potential of traditional textile technique for creating three-dimensional textile structures. These three-dimensional textile structures are used to generate the style of freestanding functional textile object and to create a product for the public room.

The subculture and techniques involved in Thai textile techniques are the inspirations throughout this project. For example, sitting on the floor is prominent in this subculture and is, therefore; an initiation of the furniture development in this project. Meanwhile, Scandinavian design also influences the aesthetic and finds out the simple solution with its simplicity and functionalism. Nature is also a powerful source of inspiration in creating these three-dimensional knitted textiles.

These factors influence the method used to explore techniques, colours and style. Moreover, sociology is considered to guide the design process and to determine the style of freestanding textile object, for instance; the relationships among people.

“Texniture” is a name given to the freestanding functional textile object and is a kind of the furniture created in this project. The result shows how three-dimensional textiles can be manipulated in space, and aims to give audiences a new understanding of textiles.
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Textile materials are ubiquitous, most common in product design, and usually not freestanding objects. This thesis focuses on using the textile potentials to create a freestanding textile object that gives a multipurpose product in functionality and aesthetic.

Thailand and Scandinavia are the design influences of this thesis. Thai folk art is well known for its elaborate pieces, and Scandinavian design is well known for its simplicity. However, in both Scandinavian and Thai designs, functionality is a key for the design process. The Thai triangular cushion is an inspiration on its simplicity and it exemplifies the similarities between Scandinavian design and Thai design in order to find out simple solution.

The input data for my research is Thai mural painting through which one can see how Thai textile traditions and living style are depicted. These depictions have formed the basis for which practices have been looked into more deeply and have led to research in living style, handicrafts, textiles, and so on. In parallel, Swedish nature in the Swedish design context is a strong inspiration and works as a catalyst to embark on the initial stages of the creative process. These sub-cultures and nature are prerequisites in generating creativity and creating good design.

Thai living on the house floor and Scandinavian simplicity are expressed in the style of this freestanding piece. Furthermore, sitting on the house floor impacts human behaviour and the relationships among people. This phenomenon affects the decisions that are made in the design process and become the parameters for product design.

Textile techniques, for example knitting and weaving; are used as tools in this project to realise the goal of creating a freestanding piece. These techniques are used to explore three-dimensional structures in order to create constructions for the freestanding piece. Thai mural painting and Swedish nature are the inspirations to generate form, inspire colour choice and material choice. Handicraft and industrial production are combined in this project in a way that is intended to make the essence of craft more readily available. Industrial production is necessary for producing an appropriately high quality and a large quantity of product.

This project can be designated as a melting pot of sub-culture in a design context. The freestanding functional textile piece aims to give the audiences a new understanding of textiles. This thesis addresses how textiles can be created as the freestanding pieces.

Project idea and aims

The aim of this thesis is to design a freestanding functional textile object according to Thai sub-context and Scandinavian sub-context in simplicity as the principles. Moreover, I aim to explore the potential of the traditional textile technique for creating three-dimensional textile structure in order to generate the style of freestanding functional textile object. I will design a product concept that gives a multipurpose product in aesthetic and functionality in order to decorate and to be utilized for the public room.
Sitting on the floor is well-known simple living style like Scandinavian design’s behaviour. I would like to introduce sitting on the floor lifestyle to Scandinavian people. In addition, I would like to emphasize that the Thai living style on the house floor makes sociology in the relationships among people. It determines the products that are used on the floor. Due to the sociology basis, an act of sitting on the floor forms the folkways of conducting the activities together for Thais. The public room, for instance the rest area in the building; is an example of location to place the products. This is because of it makes the freestanding functional textile object can be noticed easily by many people in the public place. It is also utilised to decorate the interior; therefore, it leads me to design and create a product that gives both the sitting function and the decoration for the interior in the public room.

The initial idea takes place by looking through the Thai mural painting and Swedish context that generates a lot of information used for the origination of the experiments. The transformation of the initial idea has influenced by artists and designers who influence the thinking process of each experimental step. This influence becomes the method to allow experiments to be more diverse. The traditional textile techniques are expressed by making small models in three-dimensional that is the main practical method employed in order to realise the criteria. The other necessary method is also employed such as tie-dye, dyeing. The production process and equipment will be documented under “handustrial” which is generated from the combination of handicraft and industrial process. Moreover, I am choosing to create the scenario of sitting on the floor in order to obtain the information and to understand easily about the real situation in people’s behaviour while sitting on the floor. The result of the scenario will be used to help making a decision as the parameters to narrow down the data and to be the frame for the design.
There are many types of textile materials. In fact, textiles are necessary for people in order to protect them from the elements, in other words; textile has become a second skin to protect the human body.\textsuperscript{1} Textiles can be found everywhere in our surroundings, for example; a fabric-covered sofa, a curtain-draped window and so on. Textiles can be more than patterns and washables. Nowadays they also serve as visible or hidden and interactive.\textsuperscript{2} Craftsmanship is an essential part of high-tech production. Both are necessary to create a whole that is greater than its part.\textsuperscript{3} Textile development is progressing fast due to new types of technological support, for example; a solar panel may be incorporated into a fabric. This may also lead to consideration of how non-technologically supported textile development might look when using only handcraft.

‘Shredded selvedges, hand-stitched surfaces, and woven textures may be the hallmarks of traditional textiles, but in the hands of contemporary designers, these craft techniques signify the fabrics of the future’.\textsuperscript{4} This statement by Quinn is personified in the project presented here in this thesis where the handicraft and design aspects combine in bringing forth new possibilities. This following quote shows what the industrial production and design process can add to a piece of craft and how its value can be altered or increased. ‘Manufactured goods embody innumerable myths about the world’.\textsuperscript{5} Myths and stories can be created in a design context to give people the picture the designer wants them to have, whether or not this picture does in actual fact reflect reality or not. This involves practical solutions that are developed through traditional textile techniques in order to generate new exciting concepts. Meanwhile, the industrial process will support the story by producing a good quality in a large quantity. This process emits professionalism and credibility and enables the designers to reach out and make the essence of crafts more readily available. The advantages of manufacturing and craftsmanship together are that they generate a new aesthetic and makes craft-based innovation more available.

\textsuperscript{3} Dna, Design and architecture report #1 Almedahls daylight control solutions p.14 Almedahl-Kinna AB
\textsuperscript{4} Quinn, Bradley., 2009. Textile designers at the cutting edge. London: Laurence King Publishing Ltd.
Picture 1 Thai mural painting (http://gotoknow.org/blog/textileart/145694?page=1)

Picture 2 AHIT by Camilla Dierich (http://www.diedrich.se/)

Picture 3 AHIT color by Camilla Dierich (http://www.diedrich.se/)
Thai context

Thailand’s history can be seen through mural paintings which traditions, living styles, handicrafts, and textiles are depicted. The characters of the painting are shown through light colours upon a dark background in order to sharply accentuate the figurative contours. The colours are sourced from nature, for instance the color ‘Rong’ is from the resin of the tree that gives a yellow color. Thai mural painting used to be an inspiration in order to generate the new idea that look at the subcultures, for example; sitting on the floor and Thai textiles. (see picture 1)

Scandinavian context

‘Brukskunst (useful art) is an essence of Scandinavian design. Scandinavian design has been guided by a humanizing approach to Modernism distinguished by functional practicality and the sophisticated simplification of form’. Scandinavian designers have attempted to enhance quality of life by improving their surrounding environments. This is considered in design that not only the aesthetic gives people good emotion, the product also will give function that make people convenience.

Due to the climate in this area, it is dark and cold much of the year with a few brilliant and beautiful months. This is perhaps why nature is an important factor in influencing Scandinavian design in my opinion.

From my point of view, because of the long periods of darkness, it is of interest to inject colour into the public room or the home to create a warm and cheerful atmosphere, which may tide the inhabitants through the periods of darkness. This is however not the norm in Scandinavia with its simple, clear, desquamate design style. (see picture 2) There are, however; designers that do work with more colourful, less simplified forms that also retain an element of Scandinavian design. An example of this is A HIT with their colourful oversized dot motifs which retains a Scandinavian feeling through the clear contours and contrasts in the work. (see picture 3)

This leading natural environment is considered to be an inspiration for creating the textiles and colours in the project. Also, this is used to find the colours in the Thai context.

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8 Fiell, C., Fiell, P.,Scandinavian design today. (Online)Available at: http://www.scandinaviandesigncenter.com/News/sek1/9025&currencychanged=1 (Accessss 10 May 2010)
Sitting on the floor

“In a preceding research project ‘sitting on the floor’, Thai living style on the house floor is discussed.9 Thais are familiar with sitting on the house floor due to the fact that Thai house floors are elevated from the ground for protection from floods and also for ventilation. This creates a ventilation system for the house that gives the inhabitants physical comfort. This phenomenon is a focus in this project and has led to observation of the activities that take place on the house floor in Thailand. This leads to the sitting on the floor that shows sociology in human behavior. It makes better the relationship between family members and friends. This is very important to be investigated for this thesis and is used to be a parameter to generate and create the products. (see picture 4 and 5)

Sitting on the floor for a long time definitely makes people uncomfortable. The research carried out was on human behaviour at a party where 50% of the guests were Thai and there was no chair. Everyone was made to sit on the floor or on a cushion. It could be seen obviously after two hours that no one was comfortable by sitting on the floor. Someone felt fatigued. Many people lay down on the floor or leant against the wall. Moreover, the floor situation made people tense and they attempted to help each other relax through activities such as massage. These lead me to consider the function of the product that relate to a Thai triangular cushion, which is widely used on the house floor in Thailand. Also it relates to the Scandinavian design in the simplicity and the function. Thai cushion become an inspiration to generate the idea of the product in aesthetic form and be parameters for creating the product in functions such against the backrest and cushion the body. (see picture 6)

9 Sujirapinyokul, A., (in press), Sitting on the floor, Research project, The Swedish school of textiles, University of Borås.
Thai textiles

The Thai textile is depicted in the Thai mural painting that is used to be an inspiration to create textiles for this thesis. In fact, the Royal Thai project is an example that relates to the history of Thai textile. The project was established by Her Majesty Queen Sirikit and based on her concern that Thai folks and crafts were on the decline and would soon be extincted. This played a vital role in the revival of traditional Thai crafts. HM Queen Sirikit aimed to conserve folk arts by creating a market for the crafts and thus helping many people earn a supplementary income. This led her to establish an organisation called SUPPORT in 1976 to assist the Thai people, for instance; through embroidery and weaving in the North and through producing a kind of silk fabric with woven ikat or rhombic patterns called Mudmee in the northeast.10 (see picture 7) These economic incentives and encouragement have gained and enhanced knowledge and skills for the area of handicrafts for many Thais and have succeeded in protecting Thai handicrafts extinction and creating a strong national craft identity.

However, it is difficult to know whether or not these techniques come originally from Thailand or from elsewhere. An object made from a pattern is not only the copy of the copy that substitutes reality because no one remembers or recognizes the original any longer, but it is also the product of our creative powers that becomes the manifestation of nostalgia for something that has been lost. ‘Myzelev (in 1994:3) suggested that the traditional crafts become the concrete sign of the loss of representation power. Related to the past and conceived nostalgically through connection to our parents’ and grandparents’ domestic activities’.11

Therefore, all traditional textile techniques can be said to be Thai national treasures due to the fact that nobody is able with confidence to establish the true origin of craft. This enables one to create Thai craft in a design context with whatever craft technique one chooses as the story is what important in convincing people of the crafts authenticity. Following HM the Queen by integrating the handicraft with the design is the method to create the identity for designing products in the thesis. Textile techniques are investigated for creating the experiments in the design process. For example, I could use the weaving technique and the Mudmee technique with as much justification as any other craft techniques.

Not only Thai textile techniques are investigated in the research, Scandinavian textile also is investigated through the knitted textiles because Scandinavian people are accustomed to the knitted textiles. Scandinavian design is normally influenced by natural environment that is used to generate the idea for creating knitted textile part in the three-dimensional.

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Designers and Artists

Picture 8 Eye love SUPERFLAT. 2003 (Murakami's creation)

Picture 9 Superflat Jellyfish Eyes 2, 2003 (Murakami's creation)

Picture 10 Chalermchai's painting (http://picpost.mthai.com/view_picpost.php?cate_id=37&post_id=334077)
Takashi Murakami and Chalermchai Kositpipat

’When I consider what Japanese culture is like, the answer is that it is all about the subcultures. Therefore, art is unnecessary, Murakami said’. In my opinion, these can be interpreted as the surroundings in Japan are the subcultures, for example; cherry blossom, anime, and so on. All of these subcultures create a unique set of codes and ways of thinking that affect the subcultures of design in a specific way. As a result, the art itself is no longer the most important thing but the process of how it is created, including all aspects of the contributing subcultures are of utmost importance. (see picture 8 and 9)

Murakami has persuaded me to look at the Thai ordinary surroundings instead of the national culture that is recorded to be the identity of the nation. My vision is opened to look at the sub-context in order to generate the new perception of the culture in the sub-context. This supports the idea of using Thai life style in sitting on the floor to generate the experiment. Therefore, looking at Thai subcultures instead of Thai culture as a whole, which becomes unavoidably a simplification of many subcultures combined, will perhaps enhance Thai design and shift Thai design into a more contemporary context.

Murakami is a contemporary artist that anime is the featured character of his work especially using many colours in his works. These colourful works relate to a contemporary Thai artist, Mister Chalermchai Kositpipat. Buddhism is the inspiration in his work. The new colour pallet of Thai mural painting has changed from single colours to very colourful painting due to his creations and the development of new synthetic colour. Thais were extremely astonished over the new style of his work. One outstanding feature is the combination of colours and the colour gradients that merge and converge smoothly. This has a direct impact on the traditional styles and now many mural painters paint in a broad colour range. It can be said that he is either defying tradition or is innovating a new style of Thai mural painting for the country.

The combination of colours and the colour gradients that merge and converge smoothly influenced to find textile techniques to colour on fabric with smoothly gradients. This led me to search a traditional textile technique that can blend seamlessly the colours together, for example the Mudmee or Ikat technique with tie-dye method. In my point of view, there is a potential of blending colours seamlessly in this technique, which is investigated in this experiment during the design process. (see picture 10)

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Ulla Eson Bodin

‘Cullus is a three-dimensional knitted fabric that has appeared in the shape of an egg carton. It is adapted for public interior space in order to benefit modern public rooms and act as a sound absorbent’.\(^{13}\) In my point of view, Ulla Eson Bodin saw the potential in textiles to develop fabric from normal materials to become sound absorbers that give the function for the fabric. Her vision has been built upon later on by others and the research into this area continues. It can be said that an egg carton fabric is like a piece of art in the public room; meanwhile, this art piece serves as a sound absorption. This has changed the way people see the role of textile from the ordinary materials to the functional textile materials in public contexts. I look at the Ulla’s method in making functional textile for the interior. It is considered to the end prototype that gives both the function and the aesthetic for people in the public rooms. (see picture 11)

Ulrika Måntensson

‘Ulrika Måntensson creates textile structure in different scales’.\(^{14}\) She has greatly explored shape, form and scale in textiles. This has become her trademark as she works mostly with decorative products. Meanwhile, because of the large scale, the textile surfaces and textures have become seemingly three-dimensional. Moreover, it can be noticed that her work has led to striking visuals especially from a distance and provokes audiences’ imagination and creativity. The size of her work makes a big impression and gives understanding to the design quickly and enhances the imagination of the audiences farther in the same time. (see picture 12 and 13)

The matter of her works is to only generate two-dimensional surfaces becoming three-dimensional texture for the fabric; however, it does not meet the goal that she has considered in her work to create the different scale of the textile structure.

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\(^{13}\) Bodin, U., 2008. Cullus-from idea to patent. The Nordic textile journal,1,pp. 30-51

This leads me to consider the missing part of her work to create the real different scale of the textile structure. In my point of view of the different scale of the textile structure shows obviously the whole view of the textile elements, for example; clearly the big knitting loops, obviously the big intersection part of the warp yarn position, and the weft yarn position of weaving structure and so on. The method is to change from the tiny-size structure to the over-sized structure.

There are still many existing products that use textile structure to create form. Many more textiles are expressed in the two-dimensional surfaces that are used for products and furnishings, for example Pleats-pleats and Phat knit. These two-dimensional textiles need to be investigated in order to develop and generate the real three-dimensional products incorporated with the Ulrika’s method in creating the textile structure in the big scale to make good surroundings in the public room. (see picture 14 and 15)
SCOPE OF THE DESIGN

In realising the goal of keeping the user close to the floor whilst using the piece of texniture there has been reached a high element of success. This leads to design criteria for the design development which include:

- The texniture which accommodates four people as a sign of the relationships among people.

- The texniture is a freestanding functional textile object that includes the function and the aesthetic in one piece.

- Thai sub-culture and textile technique are informed in the design processes.

- Thai triangular cushion is used as an inspiration to generate variation in functionality with lean back and lie down.

- The simplicity in Swedish design is informed in the aesthetic and find out the simple solution.

- Thai and Swedish natural environments are used as an inspiration to create knitting part.

- The fabric experiment is created in a three-dimensional form and texture by different scale of textile structure method in order to create a freestanding object.
The weaving experiment

The trials started with larger weaving in the different weaving pattern and the results showed the effective technique that one pattern was a regular pattern but another showed the different outward structure in the knitted fabric appearance. This difference impacted on the feeling of the contrast between the technical textile and the result of the outward fabric. This stimulated me to select the knitting appearance rather than to choose the ordinary weaving pattern.

These trials also reminded me of the weaving craft that could be seen clearly in the size of the weft yarn. The larger structure was also the method to explore the potential that can make the three-dimensional form and texture. It was manipulated in the two-dimensional experimental piece. It became the three-dimensional piece by rolling. The roll reflected the Thai cushion’s functionality that it was used as a backrest. This led me to explore the roll experiment; as a consequence, it reminded me to how to roll a mat. So, the roll experiment became a technique to generate the idea for creating a product. Due to my profession in creating three-dimensional form and texture, these stimulated me to create the form by using weaving technique. The weaving basket was investigated for a technique to generate the variation to create the product.
The knitting experiment

Ice covered red kale was used as an inspiration and an evidence to explore three-dimensional forms and textures. It was considered in the aesthetic that look through the elements of kale shape and form. These elements reflected the difference of color gradient and shade. The elements were investigated through ice balls on the leaves, the leaf layers, the leaf forms, and even the contrast of colors. (see picture 18-24)

To explore the knitting structure, I investigated the trial and error several times with cam parts. The first fabric normally did not come out perfectly; it looked like unraveled piece or spider web. However, it became the evidence to develop later sample from observation of the previous cam parts technique. The findings were suggested to develop with later fabric sample with the same technique or to combine with the new technique. (see picture 25-27)

The results was seen obviously in three-dimensional forms and textures. (see picture 28-30)

Thai cushion

Due to the similarity principle, Thai cushion was selected as a model to generate idea for creating the product in this project. It was realised in the form and the functionality that Thai cushion is subjected for sitting, leaning, and it can be folded. These became the parameters and the method of sitting and leaning. Sitting and leaning were the parameter of the functionality, whereas; folding became the technique to create the function.
Both experiments were compared in the aesthetic that bamboo could reflect to the traditional Thai material as well as the plastic tube expressed itself as the contemporary material. These experiments also created the three-dimensional form and texture especially the low relief of the bamboo experiment was evident than the plastic tube experiment. So this bamboo experiment was selected to explore further for creating the pattern, the surface and the three-dimensional form.

Straws were inserted into a pillowcase to create comfort for the seat. But in some of the seat straws were visible to create a beauty of material and to make a contrast between fine material of fabric and rough materials of straws. However, the aesthetic and the quality are decayed and fractured easily when the time passes. This allowed the searching of durable materials, which I focused at plastic tubes and bamboo woods.

-The texniture will accommodate four people, because it is considered in the relationships among people.
-The texniture will be a freestanding functional textile object that includes the function and the aesthetic in one piece.
-Thai triangular cushion will be used as an inspiration to generate variation in functionality with lean back and lie down.
-The fabric experiment will be created in three-dimensional surface and texture and freestanding form.

Roll technique

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The experiment of roll technique, making weaving in shape, form and fold technique

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- Thai triangular cushion will be used as an inspiration to generate variation in functionality with lean back and lie down.
- The fabric experiment will be created in three-dimensional surface and texture and freestanding form.
The result showed the movement of the pattern becoming more dynamic when compared with the previous bamboo experiment. This interest developed a small model to be a prototype in order to establish the technique that was appropriate for further development. (see picture 36)

Bamboo tubes were determined instead of bamboo sticks because of the strength. While non-woven fabric was chosen because of the material that is well-known in Scandinavia. (see picture 37)

Making weaving in shape

The rolled papers were initial trials to create basket form. It can be seen that the rolled papers could create a freestanding piece. However, the rolled papers were definitely not durable, so a new material was investigated for creating the freestanding form. It was noticed from the experiment that this weaving structure was compressed down and it would bounce back when it was released. The bounce became input data to find a new material that is durable and flexible at the same time. (see picture 38)

A metal wire rope sling was used to this experiment because of its strength and flexibility. This became important due to the functionality that the seat must perform under pressure and weight. (see picture 39)

![Picture 36 The pattern development](image36)

![Picture 37 The development of roll chair size w 55x 200 cm](image37)

![Picture 38 Rolled paper](image38)

![Picture 39 Metal wire rope sling](image39)

![Picture 40 Knitting structure in bubble appearance](image40)
Sitting on the object was taken into consideration in the aesthetic of the shape of the object. This made the shape of the object collapse, so the object had to regain itself to the original form. This interest of the form under pressure and weight led one to further develop this experiment into a prototype. The form of weaving was related to a sample of knitting structure because of the similarity to the bubble form. Therefore, knitting bubble structure was developed further by increasing the size from small size to over-sized scale in order to meet the goal in creating a freestanding functional textile object.

In my point of view, this knitting experiment was more interesting than the weaving experiment. Because the knitting experiment can stay in shape by its structure as three-dimension, but the weaving experiment gave the look of a framework. So the knitting experiment was chosen in this step.

**Fold technique**

The sketch showed the method of folding cushion in two styles that were interpreted their aesthetic in making triangular form. This was considered in making a small model to establish the form which the technique was appropriate for further development. (see picture 41 and 42)

A small model showed the possibility that it could create the similar triangular cushion form with fold technique. However, the appearance of the form was similar to the existing product in actual market, therefore; the factor was abandoned. (see picture 43 and 44)
Designers have sought inspiration as much from the delights of the natural world. This statement was considered that the natural environment is the connection to generate the design inspiration that the root of colors of Thai mural paint came from the nature, for instance ‘Rong’ is from the resin of the tree, which give yellow color.

The combination of colours and the color gradients by Chalermchai had influenced to the artistic development to create the textile technique. It was looked back at the traditional textile, ‘Mudmee’ technique or Ikat is able to create gradient. So this technique was selected for creating the textile pattern. It was considered that Mudmee could communicate and represent itself as Thai folk art; however, the appearance of Mudmee was still the conservative style. Therefore, the Mudmee technique was developed in the process of combining two techniques, which were the tie technique of Mudmee and another technique in order to shift the design and becoming the contemporary design. The tie-dye technique was integrated with other method that knitting was exemplified and was used to create fabric. This textile experiment was named Iknit that came from the combination of Ikat and knits.

Also, Iknit became the mixed culture in order to shift Thai design to the contemporary design. This influenced and projected to the colour source to explore the colours which represents Thailand and Sweden or Scandinavia.

Color way

Turmeric represented the Thai yellow colours while blueberries acted for Scandinavian purple colour. The results showed that not only yellow and violet or blue were the outward colours, a green colour appeared by the overlap of two colours during the tie-dye process, and a red brown colour and a light blue colour appeared during the fixative process. This fabric collection was the same in using the same colour dyestuff and be different in each fabric due to tie the yarn in the different width. (see picture 45-48)
Furthermore, each fabric would have the different pattern by changing the beginning point of yarn during cast on during the knitting process. This made the featured of the iknit technique. (see picture 49 and 50)

‘Alun’ was the fixative to preserve the colours on the yarn and was a parameter to create the unexpected colour on the fabric. Alun caused a blueberry colour that became a red brown colour, a purple colour, and a light blue colour. The time was the important factor that affected the blueberry colour. It showed the violet colour in 15 minutes of dipping yarns into the solution and it showed the purple or the light blue colour in 25 minutes of dipping yarns into the solution. Alun also affected the overlapping of two colours that made a green colour and a dark green colour. This affected to the shade of the yellow colour as well.

It can be noticed that colour gradient appeared automatically during the process of tie-dye and fixation. These made the movement of the pattern on the yarn and it was obviously seen after producing fabric with the knitting process. It can be said that this knitting process made many dynamic patterns for the iknit fabric.
ANALYSIS

These experiments were intended to produce a freestanding functional textile object. This was the combination of the art piece and the functional piece. It was the main issue that became the most important in making a decision.

There were 2 models in the analysis.

- Roll seat
- Basket seat or knitting seat

Roll seat

The roll technique was the method for making structure and form. It could be noticed when the seat was rolled, it became a timber. The aim of the project was to create the freestanding object, so this experiment could not achieve the freestanding object. (see picture 51)

Basket seat or knitting seat

It was strongly concerned that a product was a freestanding-functional textile object. It must be certain that bubble will appear to create the function for the object, so the size of knitting seat was adjusted from a small size to a big size in order to show that it stayed in its shape and could be utilized as a backrest. (see picture 52)

This met the purpose in using the ability of traditional textile and technique for creating both the freestanding textile object and the functional object. So this experiment would be considered to develop the small model and later extended into a prototype.

PROTOTYPE DEVELOPMENT

The development had given importance to the sociology as it made the relationship among people. This made the function for the object. It became the significance of the texniture development.

The development was divided into two parts:

- Material development
- Aesthetic development

Material development

Construction

The knitting structure became the construction rather than basket construction due to the appearance of weaving structure. It became the framework whilst the knitting structure could make the bubble form exist in its form. The big scale of textile structure was still relevant to be a decision for creating the texniture. Therefore, the rope yarns were used instead
of threads due to increase the size of the chair. The sort of rope was inspected in the quality for producing the texniture. Related to the initial weaving experiment, the weight and the properties were significant to create form and shape.

The natural ropes were lighter than the synthetic ropes in the same size. Wool was lighter than other natural materials, for instance jute, hemp, and cotton. So, wool was selected for making the core. However, if wool was only used for creating the core, the seat will be hard and uncomfortable, so the upholstery was used to cover the core in order to make the seat soft. (see picture 53)

However, the aesthetic of the gorgeous wool material disappeared, it led other upholstery. Looking back at the initial material of weaving experiment, the wire rope sling was used to be the construction due to the rough materials but it needed to be covered by other materials. The size and the properties of the wire rope sling have been considered for adjusting to the suitability of the knitted structure by reducing the size of wire. These increased the flexibility when compared with the weaving experiment. Moreover, the wire rope sling was harsh and rough, so it was upholstered with foam cylinder, which made soft and flexible.

**Textile**

The appearance of the foam cylinders and wires did not persuade audiences to visit and touch an object, so it was necessary to hide foam cylinders with the cover. However, the texniture was a low seat that people step on easily. Therefore it was necessary for the material that have strength enough and foam cylinders should be covered with durable materials. The long-lasting materials were considered for the reason of people stepping on the object. Moreover, the maintenance is also important for a low chair, it should be easy to clean. This was leading to synthetic materials were considered for the texniture.

The efficient strength and the long-lasting material were the main issues for selecting the right material. The polyester and the polyamide were investigated in strength property and durability.

The tie-dye technique normally used room temperature for colouring the threads. Moreover, this technique suited with the natural fibers. But the tie-dye with room temperature could not be used with synthetic materials. So, polyester did not meet this handicraft process with room temperature. However, polyamide had more ability to approach the handicraft process because it was success to color with room temperature. So polyamide was selected for color and pattern.

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Aesthetic development

- The texniture which accommodates four people as a sign of the relationships among people.
- The simplicity in Swedish design is informed in the aesthetic and find out the simple solution.

Form

The original form was developed in the aesthetic and the functionality in order to meet the set of criteria. (see picture 54)

Development 1 was interesting in aesthetic with heart form that related to the love emotion. However, making the relationship among people was the main issue in sitting on the seat together. In comparison between Development 1 and Development 2, it can be noticed that there was less space in Development 1, but Development 2 had enough space for sitting together. This point led free form that met the criteria. It was developed further for the texniture. (see picture 55 and 56)
Color and pattern decision

The idea of injecting colour to the product was passed to the freestanding functional textile object, according to the form of the experiment which looked like the small hill. It was imagined to the meadow on the hill that people lie down on grasses and flowers. Grassland and flowering lands became the keywords for making a decision; however, it has to indicate the source of the colour. Due to the representative Thai colour in the yellow and the Scandinavian colour in the light blue or the violet; as a consequence, the yellowish fabric sample was selected to place on the freestanding functional textile object.

This projected to integrate the colour to the product development. It was relevant to the idea of increasing the size of the textile structure. This persuaded audience recognizing the traditional handicrafts. The knitted fabric was considered for making the cover because of relating to the Iknit. So the knitting fabric was used for covering the core and was interpreted itself as the threads in the big scale. This clearly made the outward of the aesthetic of tie-dye pattern being existed in the interior. (see picture 57-59)
RESULT

This thesis gives a 1:1 scale prototype at 2.00 m by 2.30m by 0.55m. This size enabled the accommodation of four people. The prototype performed itself as the object that had both the sitting function and the decoration for the public room.

The assembly of this prototype had rope sling wire which was the main core of the big rope upholstered with foam cylinders. Plastic sheets were used to cover the foam cylinders in order to facilitate the fabric pushing through the foam cylinders. The total length of the big rope was 137.20m. They were knitted as the freestanding functional textile object and the total diameter of the rope was 6cm. (see picture 61-64)

Fabric tube was made from polyamide tube by the stoll (industrial knitting machine with model TC 340) and the length of the fabric tubes was 138 meters. All fabric tubes were dyed with acid dyestuff colour at the room temperature and used tie technique to divide the colour. The colour process gave 4 colours: white, yellow, purple, and green. However, only 2 colours of the acid dyestuff colour were used to colour the fabric. These were the yellow colour and the purple colour. The white colour was from the original colour of fabric that was tied with the plastic rope, and the green colour was from the overlap of the yellow colour and the purple colour.

Assembly

The prototype was produced within 4 days and it was assembled with 9 persons. It was possible to reproduce the second pieces within 3 days and a half day. The assembly time would reduce due to the developed skill of the workers. It likewise would reduce steadily the number of the workers; i.e., From 9 persons to 8 persons, and it would be possible to reduce to approximately 7 workers in the next time.

1. The rope wire sling was upholstered with the foam cylinders.
2. The foam cylinders were covered with the plastic sheets.
3. The fabrics were push through the foam cylinders.
4. The complete rope was knitted into the shape and form becoming the texniture.
REFLECTION AND DISCUSSION

The weaving experiment was successful in meeting the criteria of integrating Thai-subculture into the project. This was done by using the traditional weaving technique. The shape and form has also a strong Thai influence but the weave gave the appearance of being a framework, which was undesirable. Knitting was then used to create a freestanding-like appearance. The form of the seat was directly impacted by the knitting structure. This made it difficult for the end result in meeting the set criteria as knitting is not traditionally used in Thai craft. This can however be seen, as discussed in the background section, as a development of and an addition to Thai craft through design.

The weaving experiment in the roll technique was partially successful in creating three-dimensional forms and textures; however, it did not hold its form efficiently. When the weaving experiment was compared with the knitting experiment, the knitting experiment can be seen obviously in the three-dimensional form. This knitting prototype met the criteria and was made accordingly into a successfully freestanding form through its construction.

The statement of different scale of textile structure was expressed by increasing the size of the object. This, the prototype, is functional and allows the user to comfortably lean back against the bubble form in the middle of the seat. This enables people to use the freestanding object from different directions. The object size and form allows four people to sit together. The freestanding object can also be used in a vertical position as it has enough space to
lie down in.

The prototype did not achieve aesthetic simplicity, because the knitted structure did not have a simple shape or form and the seat's form was directly determined by its construction. This can only be adjusted in accordance with other parameters. A simplistic approach was used successfully in developing the work from the woven experimentations onto the knitted result. The main aim of the thesis i.e.) the textile potential in order to create a fully freestanding product was achieved fully.

Nature was only an inspiration for choice of colour and was effective. The colours that were used could be found in nature in the form of turmeric and blueberries. A green colour was created by the overlap of the yellow and blue colours during the tie-dye technique.

The place for the end product

This project is interesting when the group of the object is placed on together in the public room such as placing on the resting area in the building has decorated the surroundings of the interior. As a result, it persuades people to sit on and to relax with this freestanding functional textile object. This idea leads this object to place on the other places in order to reveal the useful of the object to people. (see picture 65)

From my point of view the freestanding functional textile objects can be placed on together in the kindergarten. They are decorated in the room for children to play as a small indoor playground. Moreover, the first attraction can be noticed by the colour of the texniture. Colourful object directly and normally attracts to everyone and be stimulation, especially reacting with children. The colourful object is realised its important for children playground because it encourages children to touch and play with the object. This colourful object therefore will be selected for children.

During the assembly process, the foam cylinders were covered with plastic sheets in order to be pushed easily into the fabric tubes. These plastic sheets have made noise when it is stepped on the texniture. In fact that children always run around everywhere in the playground. It is certain that kids run on the texniture with noise or the sound which might be a good interactive to persuade children to play with the texniture as the instrument. (see picture 66)

Furthermore, the texniture demonstrates the activities in different places that it is placed on; for instance, in the library for people to sit on the object in order to read a book and relax. In addition, it shows the usage of the texniture that accommodates four people at maximum. (see picture 67 and 68)

From the observation of the positioning of the textile object, this textile object would be a kind of furniture. The definition of furniture is noted as ‘the movable articles that are used to make a room or building suitable for living or working in, such as tables, chairs or desks’. In my point of view, this freestanding functional textile object is not a chair; however, it gives convenience and decoration for people like the furniture has given in the public room. So this supports each other in the definition of furniture that makes this object becoming furniture. (see picture 69 and 70)

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Picture 65 The group of texniture is in the public area of the building.
Picture 66 The group of texniture is in the kindergarten.
Picture 67 The texniture is placed on the resting area of the library.
Picture 68 The texniture is placed on in the library.
Picture 69 The activity on texniture
Picture 70 The activity on texniture (photograph by Jan Berg)
However, due to the yarn size is directly variable, which can be identified by the size of the knitting needle and gauge. ‘Knitter has to choose the right material in order to fit the thread with the size of the knitting needle’.\textsuperscript{19} I made over-sized textile object. So the size of thread was changed from tiny size to larger size according to the size of the real size of object. This also made every material that was selected to use as the component of the freestanding textile object behaving themselves as textile materials, and they were interpreted to a single huge rope.

It can be said that this object can be both textile and furniture within one piece. It depends on the point of view of audiences considering this object in which direction. In my opinion, this object is a work in textile design because of its usage in every aspect of my textile context, especially creating three-dimensional knitted textile and integrating traditional tie-dye and knitted textile that become new textile appearance named Iknit. These make this object standing on textile design. Afterwards, it was created to be a product that gives both beauty and functionality. So this object names texniture that is a specific name given. Texniture comes from the combination of textile and furniture. Moreover, the definition of texniture is a freestanding functional textile object.

Comparisons with other product

Texniture is either the over-sized textile object or furniture that can be related to the work of Edra. That is BOA. (see picture 71)

I would say the similarity of Texniture and BOA is frameless. BOA was classified in the category of a sofa. It was created with the irregular weaving technique for making form of a sofa, which is built by extremely manual skill workers by 4 people simultaneously to produce the BOA.\textsuperscript{20} Moreover, Texniture and BOA were built in a specific pattern.

Texniture and BOA cannot remove the assembly because it was invented from an individually single structure. However, texniture is not made as a whole piece, its three-dimensional form will not occur. In contrast, BOA became the three-dimensional form because of the huge size and being placed overlapping and crossed only back and forth in my opinion. Moreover, it is possible to divide the tubular velvet into many pieces in order to reconstruct its form by users. These might make BOA lacking the perspective of textile, if it is compared with the process of texniture that uses the textile potential for this object to create the form by its structure.

The extreme over-sized of the textile structure is the featured of BOA that would be the solution for developing further texniture to be the furniture. In creating the size of the cylinder foams or changing from the cylinder foams to the tubular velvet filled polyurethane foam is the method that makes texniture become a sofa.

\textsuperscript{19} Karmon, A., 2010, Discussion on the right material for a knitting machine, (Personal communication 28 May 2010)
The strong point of Texniture

This Texniture is a decorative object in the public room that has the sitting function as a usage function. The use of material in upholstery is very important because of the comfort. Texniture serves the comfort in the high level for people. Moreover, it can be said that the technical knowledge in textiles was widely spread into a whole piece of Texniture. One of textile techniques is obvious that is the use of three-dimensional knitting skill to create shape and form of the freestanding functional textile object.

Secondly, the integration of the traditional eastern technique of mudmee or Ikat and the traditional western technique of knitting has made the new style of textile to audiences. The featured of the technique is to create various patterns in using the same thread. This becomes both contemporary textile design and a unique design.

These culture and textile skills influence the character of Texniture that has made Texniture being different from BOA and other products in the same line. This thesis can be the melting pot of the culture and the textile aspect that has built upon later on by others and the research into this area continue.

The weak point of Texniture

Because of placing in the public room, the cleaning becomes important for Texniture. This object would be difficult to clean. However, it is suggested to put the object on the platform in order to avoid water and to yield some technology for helping the product to avoid the dirt; for example, using a waterproof coating (Nanotech clothing fabric ‘never gets wet’) and using a soil proof coating. To use the Texniture for a short period, the form of the bubble will collapse; however, it is suggested to fasten ropes that intersect on the back in order to make the structure even more stable and strong. The project used a lot of materials that consume the resource by futile; therefore, the sustainability may be the solution to be considered in the further research.

Texniture is an individual piece that is difficult to be removed and it cannot be reconstructed the form. This requires the wide space for storage and advanced transportation.

CONCLUSION AND FURTHER RESEARCH

The aim of this project is to design the textile object that gives both functional and decorative characters for the public room. It was considered at the potential of textiles in the textile structures to create the design. I have designed a product concept, which was generated from the basis of traditional textile techniques for creating three-dimensional textile and for developing to be a decorative product. I have considered the sub-culture of Thailand for the design development with the use of Scandinavian simplicity in order to approach the contemporary design. This project can be said as a unique design. It indicates the design of my own that shows my profession in the three-dimensional textile skills mixed with culture.

The further research has considered the overview of texniture missing points. In my point of view the height is important for the freestanding object to maintain an individually unique object and be outstanding. When I look back at texniture, the shape of it is not much distinctly clear, especially looking from the distance. The height of texniture is not much high; as a result, texniture will be developed to reflect a clear shape. A sofa in the characteristic of cocoon is a product sample to develop further texniture. This leads me to consider the
structural strength and the textile technique in order to create the three-dimensional form of the cocoon. (see picture 73)

It may allow other structural strength used in the development of design; for example, the steel frame used in some parts may only be needed for the structural strength of the cocoon. To make the character of a sofa is to increase the size of the foam cylinders from 6 cm of diameter to 15 cm of diameter or more. The Texniture would be able to switch to the sofa.

Due to the consumption of the materials in this project, sustainability becomes the interest for the further research. Looking back to the textile industry, fabric manufactures have produced lots of yards of fabrics that are remnant lots of yarn left in each manufacturing in parallel. From the idea of the leftover waste materials, we should reuse to maximize the benefit by using the leftovers instead of the foam cylinders. Moreover, it can bring the leftover yarn to knit the fabric tube rather than using the new materials. This will make the new featured for Texniture and will become an individual unique object and own design.
BIBLIOGRAPHY

PUBLISHED SOURCES

Books


Articles

Dna, Design and architecture report #1 Almedahls daylight control solutions p.14 Almedahl-Kinna AB


Internet sources

Available at: http://bada.hb.se/handle/2320/4256 (Accessed 10 May 2010)

Modern Moanarch. Thailand in the 2000’s. (e-book)
Available at: http://www.thaiembassy.se/ (Access 10 May 2010)

Fiell, C., Fiell, P.,Scandinavian design today. (Online)
Available at: http://www.scandinaviandesigncenter.com/News/sek1/9025&currencychanged=1(Accesssed 10 May 2010)

Wakasa, M. and Ginoza, N., 2000, Interview Takashi Murakami, Journal of Contemporary art, Inc. (Online),
Available at: http://www.jca-online.com/murakami.html (Accessed 10 May 2010)


Edra spa. Gli album edra-Historia naturalis. (Online)
UNPUBLISHED SOURCES

Suirapinyokul, A., (in press), Sitting on the floor, Research project, The Swedish school of textiles, University of Borås.

Personal communication

Persson, A., 2010. Discussion on the quality of synthetic fiber and natural fiber, Production manager at Cordgam AB, Fritsla, Sweden (Personal communication April 2010)

Karmon, A., 2010, Discussion on the right material for a knitting machine, (Personal communication 28 May 2010)


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