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Incorporation of 'Cuir Bouilli' and Applique on Fabric for Ghanaian Symbolic Curtains

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Abstract: Designs in window curtains in Ghanaian homes, offices and markets generally portray elements associated with foreign culture. This phenomenon which has the tendency of swaging vulnerable minds for imported beliefs and ideologies could be tackled by providing alternative products which reflect Ghanaian philosophy and ideology. There are enough symbolism, techniques and resources suitable for producing window coverings to depict the cultural heritage of the people in Ghana. This study aimed to integrate 'cuir-bouilli', a leather molding technique and applique in fabric to produce Ghanaian symbolic window blinds and curtains. This dwells on the concept: of "promoting textiles through the projection of Ghanaian traditional symbols". The study employed a human-centered design for practical experiments. This design is a step-by-step guide that requires working directly with end users of a product or service to develop new ideas that are feasible and appropriate in their context. The contextual information emanated largely from documentation, archival records, and observation of physical articles. In the process, locally made leather from sheep and goat skins was manipulated with 'cuir-bouilli' techniques to produce raised patterns which were further applied on fabric by applique technique to produce a window blind and a curtain. In the end, the study entreats students and artisans to explore the potential of the integration of moulded leather patterns and fabric for other artifacts.

Keywords: Cuir-Bouiili, Applique, Tanning, Rattan, Regalia

1. Introduction

Window coverings are materials used to cover a window to manage sunlight, privacy, additional weatherproofing, or purely decorative purposes [1]. Window coverings like curtains and blinds are important textile products that form an integral part of interior decoration in both domestic and industrial buildings. They can control light, affect air circulation, insulate against weather and noise and provide privacy, enhance a beautiful view or camouflage an unpleasant one [2]. Curtains sometimes known as drapes are a piece of cloth intended to block or obscure light or draft or water in the case of a shower curtain [1].

Curtains often contribute more to the atmosphere of the room than any other item of furnishing. Plain, heavy curtains falling down to the floor can be used to create a formal setting. Short curtains made of light; brightly patterned fabrics are used to create an informal, relaxed atmosphere. Apart from creating the desired atmosphere, curtains give flexible control over privacy, heat, light, and to some extent noise. There are different types of curtains which included glass curtains, sash curtains, draw curtains, criss-cross curtains / Priscilla's, French cafe curtains, tier-back curtains cottage curtains, rolls-up curtains, and fold backs curtains.

Glass curtains also known as sheer or net curtains are popular cotton and polyester covering materials commonly used on iconic commercial buildings worldwide to give the exterior view of the building a pleasing, glossy appearance [3]. Sash curtains are types of glass curtains hung on the window sash. They can be stretched taut between rods along with the top and bottom of the window sashes or hung in loose folds. Draw curtains are curtains made of translucent or opaque fabrics and are mounted on traverse rods. In earlier days, they

were used between glass curtains and draperies, but these days they are more often used alone. Criss-cross / Priscilla curtains are curtains in which both curtain panels overlap each other at the top along the entire width of the window and then criss-cross each other when they are tied back. Criss-cross curtains generally make a window seem wider.

French cafe curtains are curtains that cover only the lower part of the window, with the casing slipped over a tension rod mounted in the window frame. They provide privacy at one level and light at another. Tier back curtains are double-decker cafe curtains. Cottage curtains are a combination of cafe curtains and tie-back curtains. Rolls-up curtains are those made of strong fabric and lined with contrasting fabric. These curtains can be rolled or unrolled to the desired position and held in place by means of a band. When rolled up, the contrast-coloured lining and top fabrics are shown off together. Fold backs curtains: These are curtains made up of sets of two-double sided shades hung across the entire width of the window on double curtain rods. They are then folded back to expose the contrasting under-panels and each panel is tied back. Figure 1 indicates the type of window curtains.

Figure 1. Types of window curtains.

Window blinds are types of window coverings that adjust by revolving from an open position to a closed position by permitting planks to overlap. They are usually made with planks of fabric, wood, plastic, or metal. There are many types of window blinds. These are roller blinds, roman blinds, Venetian blinds, pinoleum blinds, Balasore blinds, pleatex blinds, and Austrian blinds. Roller blinds are blinds that allow adequate light when drawn up, yet give comprehensive privacy when unrolled and let down. They are made of thick fabrics used in conjunction with rollers. Roman blinds are blinds made of cloths attached to cords. When the cords are pulled, the blinds rise up in accordion pleats to form a pelmet. They are

heavier and warmer than roller blinds. Venetian blinds are made of parallel slats of wood, metal, or plastic aligned vertically or horizontally which are good for controlling air, light, and view. Pinoleum blinds are inexpensive large window coverings made of fine strips of wood held together by cotton or a spring-operated roller or moved up and down by cords. Balasore blinds are cheap blinds made of strong paper fibre. They are accordion-pleated to act like folding blinds which are similar to Venetian blinds. The blinds are perforated with small holes to allow light through without glare. Pleatex blinds have smaller pleats. They are made from stronger filtered and tinted colour papers. The paper allows sunlight through but gives privacy. Austrian blinds: These are ruched fabrics (trimmed with gathers). They may be used partially raised, and when fully raised, they form a decorative decoration. They are used in banquet halls and large lobbies for a sumptuous effect. Figure 2 indicates the type of window blinds.

Figure 2. Types of window blinds.

Curtains and blinds are important textile products that form an integral part of interior decoration in both domestic and industrial buildings. They can control light, affect air circulation, insulate against weather and noise and provide privacy, enhance a beautiful view or camouflage an unpleasant one. It has been observed by the researchers that, most curtains and blinds in the Ghanaian market are imported. Consequently, the motifs in the designs project the culture and ideologies of the countries from which they are imported. This notwithstanding, there is a lack of a wide range of variety since these curtains and blinds in the Ghanaian market usually exhibit cartoons and floral designs which are either woven or printed with no Ghanaian connotations.

Meanwhile, Ghana is well endowed with raw materials, symbols, and elements that can be incorporated with various techniques to produce curtains and blinds that would project the Ghanaian cultural identity to positively impact tourism. A typical example is a technique employed in the production of "Batakari kese" (the traditional Ghanaian smock used by chiefs and warriors). This regalia has projected elements of symbols and talismans made of leather and other materials in a high-relief form exhibiting the strength, bravery, and

beliefs of the users. This study sought to tap the principle of attaching relief patterns to fabrics as applied in the production of the "batakari kese", by integrating a leather moulding technique known as "Cuir-Bouilli" and applique to produce curtains and blinds that will project Ghanaian cultural identity. "Cuir-Bouilli" is a technique that involves soaking or boiling leather to make it temporarily stretchable such that it can take any shape that it is put.

2. Materials and Methods

A human-centered design (HCD) was employed to carry out this study. This design was employed because is a more inventive method of problem-solving and the pillar of design for everyday items [4]. HCD is a problem-solving procedure that commences with understanding the human factors and background surrounding a challenge [5]. This design requires working directly with end users of a product or service to develop new ideas that are feasible and appropriate in their context. It also requires designing for people and their everyday actions to help uncover and solve the right problems using local capacities and minimal resources. HCD is about building a profound understanding with the people you are designing for; thus, idea development; construction of prototypes; sharing what you have produced with the people you are designing for and ultimately putting your innovative new solution out in the world [6]. HCD is a design framework that intends to develop solutions to glitches by including human perspectives in every stage of the process, through perceiving the problem within context, brainstorming, conceptualizing, emerging, and executing the solution [7]. HCD is a method of problem-solving that puts the people we are designing for at the heart of the process [8].

The human-centered process involves three stages which are an inspiration, ideation, and implementation [9]. At the inspiration stage, one learns directly from the people he or she is designing for as the designer immerses himself or herself in their lives and comes to understand their needs intensely. In the ideation phase, the designer makes sense of what he or she learned, identifies opportunities for design, and prototypes possible solutions. The implementation stage is where solutions are brought to life, and ultimately, to the user or market [9]. The achievement rate for the human-centered design method is high since the very people whom the design is produced for are at the heart of the design process. The human-centered design process is a practical, repeatable style of arriving at creative solutions. Instead of the three phases (inspiration, ideation & implementation) mentioned earlier, the researchers employed a four-step cyclical method which includes Research, Analysis, Realisation, and Synthesis as shown in Figure 3. These design processes served as a step-by-step guide to externalising innovation taking awareness of the people whom the designs are produced for [4].

Figure 3. *Four stages human-centered design process.*

In the four stages human-centered design process, the first stage in this context is data amassing on leather from sheep and goat skins. The data collection comprises photographs/images and writings to physique a rich context. The data analysis includes the integration of 'cuir-bouilli' techniques to produce raised patterns which were further applied to the fabric by applique technique to produce a window blind and a curtain. Realisation involves outcomes of the product or product possibilities, mass customisation, mass production, bespoke products, product standardisation, and seeking a graphical interpretation [10]. Synthesis is a planned scheme of work; engendering new elements of design and; innovating designs to produce creative notions considering current design routes and new materials and product possibilities [10].

3. Design Experiments and Products

3.1. Designing

Designs were basically centered on "adinkra" symbols due to the fact that it is among the best-known symbols that portray Ghanaian culture. A few of the symbols were selected in view of their meaning and significance in Ghanaian society. They include "Gye Nyame", "Akoko Nan", "Nkyankea", "Bese Aba", Ese ne Tekrema", "Fihankra", "Eban", and "Sankofa". In the process, some of the symbols were selected, combined, and arranged in a pattern that suits the form of blinds. These patterns were further coloured to improve aesthetics and attraction. The selection and combination were based on the philosophies attached to the symbols. In one instance, "Ese ne Tekrema" was combined with "akoko nae" and Eban to produce a single motif. Thus, the significance of the resultant motif depends on the symbolism of the three symbols involved. Symbolically, "Ese ne tekrema" (the teeth and the tongue) stands for friendship and interdependence. "Akokonan" (the leg of a hen) stands for mercy and nurturing and "Eban" (fence) stands for love, safety, and security. Hence, a design created from the three symbols carries all the attributes and significance associated with them. Several designs were created following a similar procedure; selection and editing of the symbols, combination, and arrangements of the symbols in the form of blind design and application of colours to suit the designs. Computer applications such as CorelDraw and Adobe Photo were employed in those operations.

3.1.1. Blind Design 1

The design was composed of four symbols namely; "Gye Nyame" (except for God), "Nsoroma" (child of Heavens), "Bese Saka" (sack of cola nuts) & "woforo dua pa a" (when you climb a good tree). The colours used in design 1 were tinted violet in the background, coffee-brown for the patterns, and pure violet for the outlines of the patterns depicting stitches. This design signifies support for cooperation, guardianship, unity, abundance affluence, and the supremacy of God. Such a design can suit common rooms of organisations, church halls, and offices. Figure 4 indicates the blind design 1.
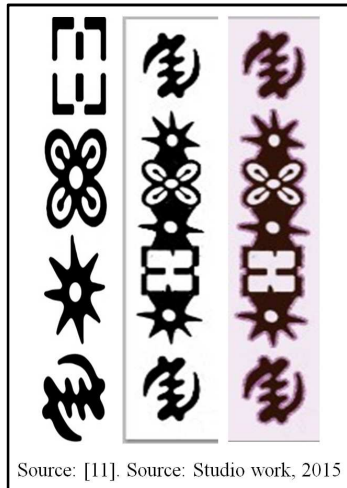
Figure 4. Blind design 1.

3.1.2. Blind Design 2

Blind design 2 was created with three "adinkra" symbols namely "Akofena" (sword of war) which symbolizes courage and valor; "Akoben" (war horn) signifying vigilance and wariness and "Ananse Ntotan" (spider web) meaning wisdom and creativity. In the design, the "akofena" was fused with the "ananse Ntotan" and arranged alternately with the "akoban". The background colour of design 2 is a slightly shaded violet combined with the patterns in a cream colour. The stitching effect is shown in a tinted violet. The symbolism of the design reflects the meaning of the symbols used. It, therefore, stands for courage, valor, vigilance, wariness, wisdom, and creativity. Thus, the design can be used in chief palaces and presidential palaces. Figure 5 indicates the blind design 2.
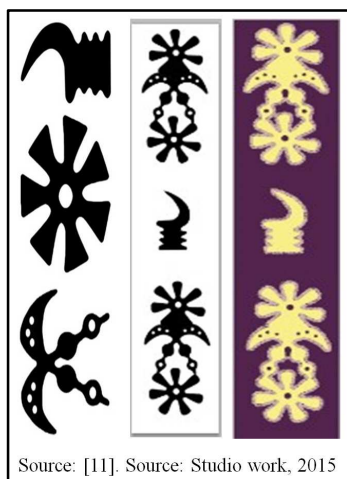

Figure 5. Blind design 2.

3.1.3. Blind Design 3

Design 3 reflects wisdom, creativity, initiative, dynamism, and versatility. The two adinkra symbols used in producing blind design 3 are Ananse Ntotan (spider Web) representing wisdom and creativity and "Nkyinkyim" (twisting) expressing initiative, dynamism, and versatility. This design consists of cream background, brown patterns, and orange

stitching effects. It can fit in reception halls, common rooms, and offices of organizations and institutions. Figure 6 indicates the blind design 3.
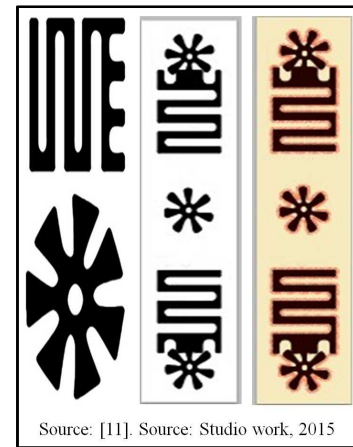

Figure 6. Design 3.

3.1.4. Bling Design 4

"Eban" and "Fihankra" were combined to produce design 4. Eban (fence) signifies love, safety and security similarly, "Fihankra" (house /compound) symbolizes security and safety. The background colour of the design is cream and the patterns are dark brown with an orange outline representing the stitching effect. The symbolism of design 4 makes it fit for any place where security is required so as to entrench confidence in occupants. Figure 7 indicates the blind design 4.
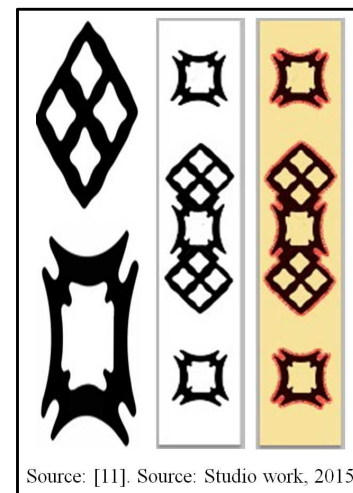

Figure 7. Blind design 4.

3.1.5. Design 5

Four different symbols were used in creating design '5'. They are Obi nka bi (bite not one another) which symbolizes peace and harmony Akoko nan (the leg of a hen) which symbolizes mercy, nurturing Eban (fence) for love, safety, and security. Ese ne tekrema (the teeth and the tongue) represents friendship and interdependence. The colours used were dark brown patterns outlined with orange on a tinted green background. The design richness in symbolism makes it suitable for use in various places including; living rooms, conference rooms, reception halls,
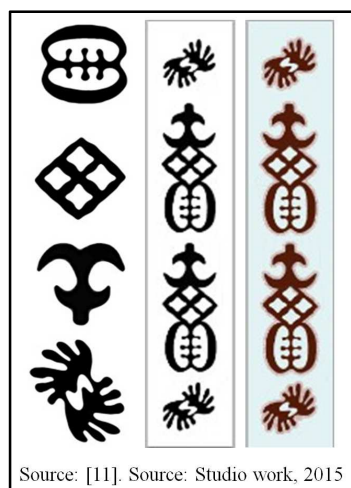
offices, etc. Figure 8 shows the blind design 5.

Figure 8. Blind design 5.

3.1.6. Design 6

Design 6 was composed of two symbols namely; akofena (sword of war) which signifies valor, and eban (fence) which stands for love, safety, and security. The symbols were arranged alternately in vertical order guarded by two vertical lines. The patterns are in orange color showing a cream stitching effect on a brown background. This design can be used in palaces. Figure 9 shows the blind design 6.
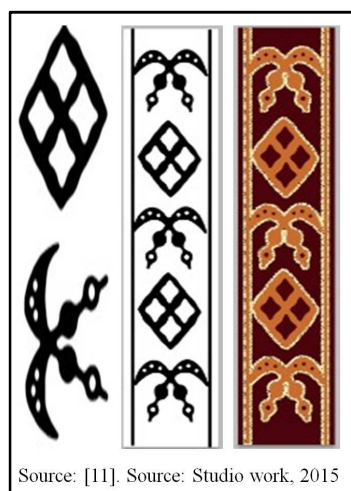

Figure 9. Blind design 6.

3.1.7. Design 7

Design 7 was made up of three symbols; "fofo" denoting jealousy and envy, "nkonsonkonson" (chain links) implying human relations and unity. "fihankra" (house/ compound) embodying security and safety. In the design, the nkonsonkonson is sandwiched between two fihankra to produce a single unit that is linked vertically by means of thick lines to two 'fofo' patterns at the ends. Colours used were tinted green for the pattern, gold for the stitching effect, and coffee brown for the background. The design in Figure 10 symbolizes affectionate protection in relationships. It would best fit homes, in the living rooms and offices or common rooms of organizations.
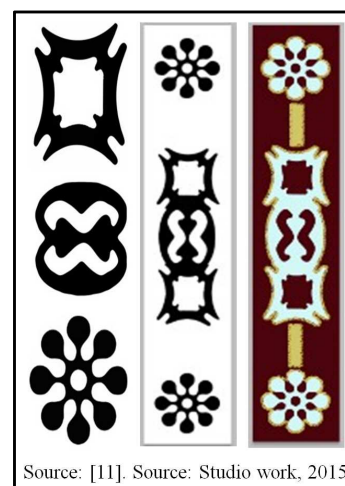

Figure 10. Blind design 7.

3.1.8. Design 8

With design 8, four adinkra symbols namely "gye nyame", "akoko nan", "nkyinkyim" and ese ne tekrema were employed. "gye nyame" (a search for God) means the supremacy of God, Akoko nana (leg of hen stands for) nurturing and mercy. Nkyinkyen (twisting) represent initiative dynamism and versatility. "Ese ne tekrema" (the teeth and the tongue) symbolizes friendship and interdependence. In the design, the symbols are portrayed in brown, grey, and cream color. The patterns, in brown colour are arranged with thick horizontal lines on the grey background. The stitching effect around the patterns is shown in cream. This design will best suit organizational offices where leadership, teamwork, and dynamism are paramount. Figure 11 shows the blind design 8.
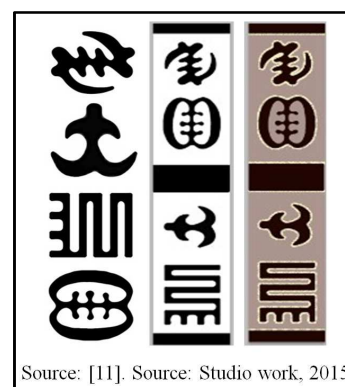

Figure 11. Blind design 8.

3.1.9. Design 9

Design 9 was composed of three symbols which were "gye nyame", "eban" and "fihankra". In the design, the "eban" is fused between two "fihankra" patterns and interchanged with the "gye nyame" patterns. They are also thick horizontal lines that serve as a network that separates the "gye nyame" from the fused patterns. The design consists of brown patterns with an orange stitching effect on a light green background. This design exhibits divine assurance in safety and security. The design can be used in auditoriums, hotel rooms and conference rooms, etc. Figure 12 shows the blind design 9.
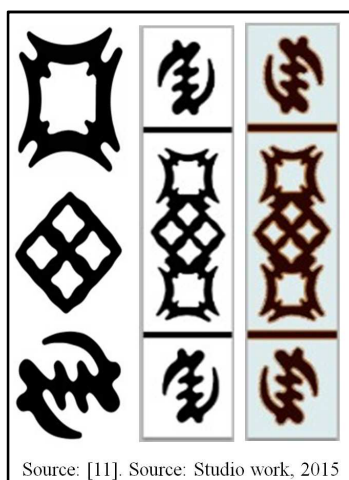
Source: [11]. Source: Studio work, 2015

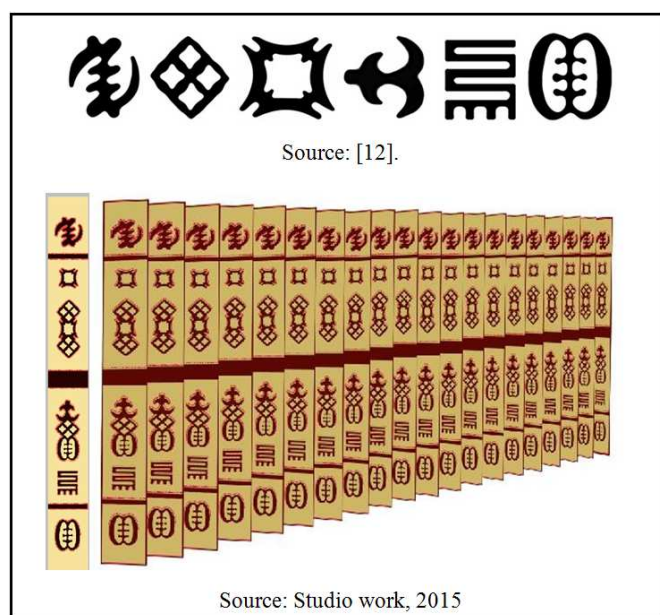***Figure 12.*** *Blind design 9.*

3.1.10. Design 10

Design 10, which was selected for the final work, was composed of six different adinkra symbols picked from the ones already used in the earlier designs. These six symbols were "Gye Nyame", "Fihankra", "Eban", "Akoko nan", "Ese ne tekrema" and "Nkyimkyim". Figure 13 shows the final blind design.

Source: [12].

Source: Studio work, 2015

Figure 13. *Final design.*

3.2. Preparation of Moulds (Design in Blocks)

Blocks used in molding the leather were prepared using plywood and strawboard for the initial trials. The plywood was eventually selected for the final blocks due to the involvement of the water in the molding process. The preparation of the blocks followed the steps outlined below:

1) Designs intended for the blinds were printed on paper in black and white.
2) The printed designs were fixed onto the plywood using adhesive.

3) The designs were pierced out of the plywood using a jig saw.
4) The cutout template was fixed on boards using adhesive to produce the blocks.
5) The blocks were placed under load overnight to ensure a firm fixture.

3.3. Key Materials Used for Blinds

Window blinds can be made with materials fabric and wood. Many fabrics are used including cotton, polyester, wool, viscose, and silk to create the blinds. In the production of the symbolic Ghanaian window blinds and curtains, the under-listed materials were employed.

3.3.1. Leather (Goat Leather)

This was moulded into relief forms symbols which were subsequently stitched onto straps of fabrics and curtains.

3.3.2. Tarpaulin Mat

This is a compound fabric composed of two main layers of which one layer is a conventional fabric and the other is an adhesive layer. The tarpaulin was used for the straps of the blinds on which the relief moulded leather was appliqued for the incorporated design.

3.3.3. Rayon Threads

The threads were used for the applique. That is what was used in stitching the relieved leather onto the fabric. That is the main binder that made the incorporation of the leather and the fabric possible.

3.3.4. Liquid Polish

As the name implies, this was used in polishing or better still, finishing the moulded leather to make them attractive and presentable.

3.3.5. The Blind Frame, Chain and Load System

These components were useful in making the symbolic Ghanaian blind possible. The main function is to carry the straps and make them operative as in the conventional window.

3.4. Preparation of the Leather

Sanding was done to remove excess tissue protruding from the inner surface of the leather rendering it smooth, light, and easy to work with. This was done in one direction. Figure 14 shows the preparation of the leather.

Source: Studio work, 2015

Figure 14. *The preparation of the leather.*

3.4.1. Stretching

Stretching was necessary to widen the surface area of the leather making it possible to accommodate more patterns. The process involved treating the leather in a lime solution for two reasons; wetting and getting rid of the unpleasant scent of the leather. This was followed by spreading the leather on wooden boards and pinning the corner whiles stretching. The stretched leather was then allowed to stabilize through drying within twenty-four hours making it ready for the next process.

3.4.2. Moulding of the Leather

Moulding was done by the use of wooden blocks prepare earlier. The stretched leather was cut into sizes suitable for the various block. The pieces were steeped in water for a few hours rendering them soft enough for the molding process. The molding process commenced by spreading the pieces of wetted leather over the molding blocks. An improvised molding tool, a pen cover, was used in pressing the leather down into the indented areas of the wooden patterns. This was carefully done to achieve the intricacy of the patterns well enough to depict the "adinkra" symbol in question. The molded leather was allowed to gradually on the molds (blocks) in a cool dry condition devoid of sun rays. This was important to avoid rapid shrinkage and wrapping, and also to render the leader suitable for burnishing processes. Figure 15 indicates the moulding of the leather.

Source: Studio work, 2015.

Figure 15. *Moulding process of the leather.*

3.4.3. Finishing of the Moulded Leather

This involved burnishing, trimming and polishing the molded leather. In simple terms, burnishing means treating the surface of an art piece with a smooth object such as pebbles to render the surface glossy. Similarly, polishing also impacts luster, however, a substance in a form of liquid, cream, or Jell is applied by brushing to achieve the shinning quality.

Both techniques were employed in finishing the moulded leather for the project. The molded pieces were first burnished to attain a smooth surface using the convex side of a teaspoon.

This was done when the molds were not fully dried. The edges of the molded leather are trimmed nicely leaving an allowance of 1 cm enough to accommodate the stitching process. The process of finishing was continued with the application of a liquid polish over the surfaces of the molded leather pieces and subsequent drying under the scorching sun. Figure 16 indicates the finishing of the moulded leather.

Source: Studio work, 2015.

Figure 16. *Finishing of the moulded leather.*

3.5. Production of the Blind

A number of operations undertaken in the production of the blind straps include: fixing the moulded leather onto the fabric in accordance with the design for the blind, stitching of molded leather permanently onto the fabric and finally joining the seams and the edges.

3.5.1. Cutting and Folding the Fabric into Straps

The fabric was laid on a flat surface devoid of dirt for the cutting measurement required for the blind straps were marked out on the fabric considering allowance for the seams. The fabric was subsequently cut according to the measurement and the number of blind straps required.

Source: Studio work, 2015

Figure 17. *Measuring, cutting and folding fabric for the blind.*

Each of the cut pieces of fabric was folded firmly according to measurement (that is 1x5x5x5 inches). The folding which was done lengthwise started at the esteem

ends. Thus, the fabric 5 inch was folded, followed by the 1-inch mark at the other ends, and finally, the last fold at the middle which was done to conceal the first two flaps (folds) made at the esteem ends forming a strap of two sides –front back. The pieces of fabric meant for the combination with the length on the straps were also but folded and ironed nicely. Figure 17 indicates measuring, cutting and folding fabric for the blind.

3.5.2. Fixing the Moulded Leather onto the Straps

Before the seams of the straps were closed, the leather molds were arranged and fixed onto one side of the folded fabric in accordance with the selected design for the blind. The straps were first laid on a long table and the design areas were marked out. This was followed by the application of an adhesive at the regions marked out for the molded leather. Some of the adhesives were also applied at the back of the molded leather which was allowed to dry for some minutes.

Subsequently, the adhesive-coated side of the patterned leather was carefully attached to the straps, which were still laid on the final design. In the process, the pieces of fabric were also attached to the straps at their respectful positions making use of office pins. Figure 18 indicates the arranging and fixing of moulded leather on fabric for easy stitching.

Source: Studio work, 2015

Figure 18. *Arranging and fixing moulded leather on fabric for easy stitching.*

### 3.5.3. The Applique Processes
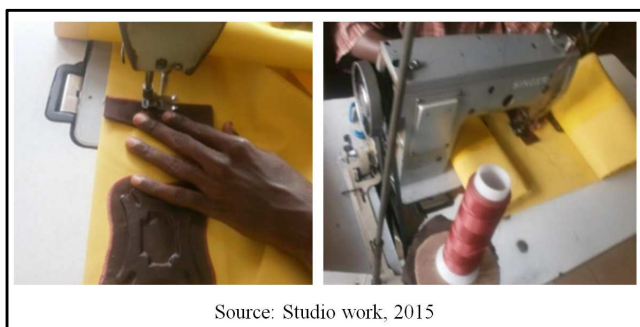
Source: Studio work, 2015

Figure 19. *Stitching of design on fabric.*

This aspect of the production involved stitching the molded leather and the pieces of fabric permanently to the straps making them ready for the blinds. The embroidery machine was employed for the process due to its effectiveness and efficiency in stitching. The zigzag stitches were used in view of their suitability for fabric and leather

combination. The leather and fabric pieces were stitched, one after the other according to the sequence of the arrangement using rayon yarns. Figure 19 shows applique processes.

3.5.4. Seaming and Hemming Process

Finally, the applied straps were folded and seamed to conceal the stitching effect showing on the opposite side. Similarly, zigzag stitches were used but the yarns were of the same colour as that of the fabric. Hemming was also done at both of the straps. The two hems were made different from each other due to the special functions they perform in the blind. The top hems which measure 2 cm were perforated at the center to contain a hook that connects the straps to the travelers of the blind frame. On the other hand, the base hem, which measures 5 cm had opened at the sider to contain chained loads meant to control the movements of the straps on the rail. Both hemmings were made with zigzag stitches in red-orange. Figure 20 displays the seaming and hemming processes.
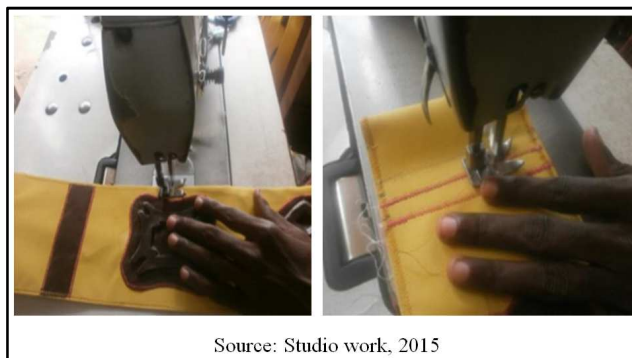
Source: Studio work, 2015

Figure 20. *Seaming and hemming processes.*

3.5.5. Assemblage of the Blind Components

The components of the blind include a set of fabric straps designed with molded leather, the mainframe that contains the rails on which the straps are hooked, a set of plastic (hanger) that connect the straps to the rails of the main frame, a set of plastic loads which are fixed at the lower hem of the straps, a chain that links the loads in the straps to one another, two different cords that control the movements and adjustment of the straps and a set of frame-holders. To assemble the components. The frame holders were firstly screwed to a wall and the blind frame was fixed on it. Figure 21 displays the fixing of frame holders.

Source: Studio work, 2015

Figure 21. *Fixing of frame holders.*

Next was the insertion of the plastic load in the hemmings at the base of the straps. This was followed by the insertion of the handers in the perforated hemmings at the top of the straps. Figure 22 indicates a blind frame fixed on holders.

Source: Studio work, 2015

Figure 22. *Blind frame fixed on holders.*

Subsequently, the straps with load sand were individually worked to the rails of the blind. Figure 23 indicates blind accessories being fixed in the straps.

Source: Studio work, 2015

Figure 23. *Blind accessories being fixed in the straps.*

Finally, the plastic chain was connected to the loads. The two cords attached to the blind frame were operated to see the functions-ability of the new window blind. Figure 24 shows blind straps fixed on the track.

Source: Studio work, 2015

Figure 24. *Blind straps fixed on the track.*

3.6. Production of the Strap Curtain

The process commenced with preliminary sketches to create a suitable design for the curtain. One of the sketches was selected and modified using the Adobe Photoshop application on a computer and used as the final design for the execution of the curtain. Figure 25 indicates preliminary sketches for curtain design.
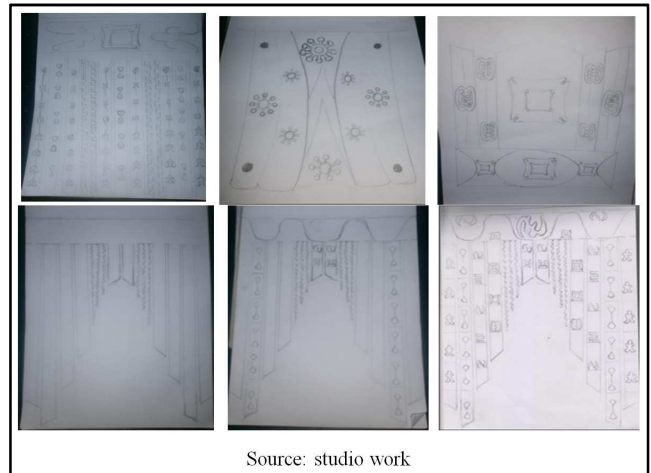

Source: studio work

Figure 25. *Preliminary sketches for curtain design.*

Curtain Production Procedure:

Step 1: The fabric for the curtain was laid on a table for cutting. In the process, measurements were taken and pinking shears were used in cutting the fabrics accordingly. Figure 26 indicates the cutting of fabric for the strap curtain.

Source: Studio work, 2015

Figure 26. *Cutting of fabric for the strap curtain.*

Step 2: The molded leather for the curtain was backed with a yellow-color adhesive-coated fabric using embroidery stitches. It was then trimmed in conformity with the shape of the leather leaving an allowance of 1 cm around it. Figure 27 shows the trimming of the backing fabric of moulded leather patterns.

Source: Studio work, 2015

Figure 27. *Trimming of backing fabric of moulded leather patterns.*

Step 3: The cut pieces of fabric for the strap-curtain were orderly laid on a broad table and the moulded leather, appliqued on pieces of fabric was arranged on them to depict the final design. Figure 28 shows the arranging cut-out

patterns for the strap curtain.

Source: Studio work, 2015

Figure 28. Arranging cut-out patterns for the strap curtain.

Step 4: An adhesive was applied and the appliqued pieces were temporarily attached to the straps to simplify the stitching operation. Thus, the adhesive was smeared both at the back of the appliqued pieces and at the straps where the pieces were intended to be stitched. The glue was allowed to dry and the pieces were stacked to the strap. Figure 29 shows fixing patterns on straps for stitching.

Source: Studio work, 2015

Figure 29. Fixing patterns on straps for stitching.

Step 5: At this stage, the production proceeded with the application of permanent stitches to bind the applique pieces to the straps. The zigzag stitches were used with off-white rayon yarn. In effect, the straps were composed of molded leather stitched onto cream pieces of fabric which are trimmed and further stitched onto wine straps of fabric. Simply put, the straps were made of appliqued on appliqued; thus, appliqued leather on appliqued fabric. Figure 30 indicates stitching of patterns on fabric for the strap curtain.
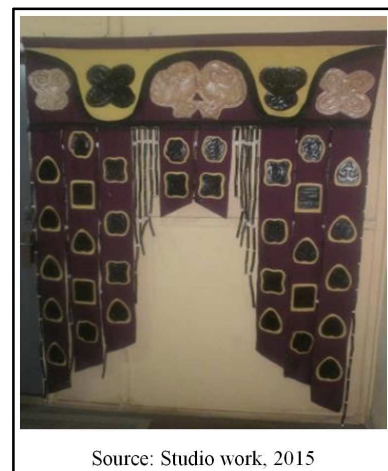

Source: Studio work, 2015

Figure 30. Stitching of patterns on fabric for the strap curtain.

Step 6: This involves joining the straps to the upper section of the curtain. The upper section consists of a pattern of yellow fabric and a rectangular wine fabric, both of which had been appliqued with molded leather and joined in a manner in which the yellow overlaps the wine. This section, which measures 1.5 by 5 feet, formed the main harness on which the straps were joined. The top edge of the strap was stitched on the harness (the upper section) one – after the other to produce the strap curtain.

Embellishment was necessary at this stage to make the curtain more attractive. As such, beads made of disintegrated bamboo stalks plastic pebbles, and cowries were fixed in between the straps in accordance with the design. Subsequently, trimmings were added to complete the adornment of the curtain. The curtain was then hung and loose threads were cut off. Figure 31 shows the final curtain.

Source: Studio work, 2015

Figure 31. The symbolic curtain displayed.

4. Discussion of the Final Products of the Study

The Ghanaian symbolic window blind and curtains produced in this study are unique masterpieces that attract viewers' attention to thinking about the concept, technology, and the effort exerted in production. Other issues worthy of consideration are: Symbolism and technical meaning of the work, physiological consideration vis-a-vis the properties of the materials used, care and maintenance procedures, and more importantly, the advantage of the product over the imported types; the discussion simplifies these issues.

The concept of the work is about the promotion of Ghanaian symbolism and culture through curtains and blinds. The intention was to sensitize the Ghanaian artisans to use common materials and techniques associated with Ghanaians in the production of curtains and blinds to:

   i. Promote and instill the belief and ideology of the Ghanaian culture in the consumer.

  ii. Provide alternative means of designing and producing curtains and blinds as job avenues for Ghanaian artisans.

 iii. Help reduces the levels of importation of curtains and

blinds which in one way or another, affect the economy of the country.

The technology employed was a combination of techniques including the high relief applique technique used in the production of "batakari kese", and a leather-moulding technique known as "cuir-bouilli" technique was used in moulding the leather in high relief form baring Ghanaian symbols. These pieces of moulded leather likened to raised objects in "batakari kese" formed the motifs stitched onto the fabric used for the curtain and blind. The on-lay method of applique, which involves simply placing the pieces on the fabric surface and stitching around them, was employed. Although the production involved a series of processes, the resultant product command a great deal of value as far as the purpose of the study is concerned. The moulded patterns in the work make it unique from ordinary applique work. However, its raised nature resembles the features of the native "Batakari Kese".

4.1. Suitability of the Curtain and Blind Designs

Out of the series of curtain and blind designs made, one of the designs was selected for the curtain and the blind. The final design for the blind consists of the following "adinkra" symbols, "Gye Nyame", "fihankra", "3ban" "Akolo nan" "Nkyimnkyim" and "3se ne tekrema". The design symbolizes the Supremacy of God, safety and security, love, mercy, nurturing, initiating, versatility, dynamism, friendship, and interdependence. The colours in the design are cream or better still tint yellow for the fabric background, coffee brown for the motifs, and red-orange for the stitches around the motifs. The yellow symbolizes Royalty and the Riches, the brown stands for stability and the orange signifies warmth, brightness, and Joy.

4.2. The Symbolism and the Technical Qualities

The concept of this study has been; "promoting textiles through the projection of Ghanaian traditional symbols". Thus, Ghanaian symbolism is the hallmark of this project; hence, every element engaged in the designing and production of the curtain and blind has something to do with allegory. 'Adinkra' symbols were used in designing. Specifically, symbols used for the blind are: "Gye Nyame," "Fihankra", "Eban", "Akokɔnan", "Nkyimkyim" and "Ese ne tekrɛma".

These were the symbols found in project one. Together they symbolize the supremacy of God, Love, Safety, Security, Interdependence, Friendship, Mercy, Nurturing, initiative, dynamism, and versatility. These attributes are well suited for window blinds designed for hotel purposes. The colours used were coffee brown, tinted yellow, and orange. Brown is the colour of the leather used for the project. Its symbolism includes reliability, stability, and comfort. These are relevant attributes required of an environment for relaxation like that of hotels. The tinted yellow (or cream) used as the background colour of the blind signifies royalty, wealth, and prosperity. Yellow is a cheery colour that embodies warmth

and light. It is, therefore, suitable for the reception of visitors and customers in the hotel.

Orange is the colour of the yarns used in stitching the moulded leather onto the background fabric. It symbolizes beauty, balance, warmth, and among others, demanding attention. This colour combination looks so harmoniously symbolic and attractive that befits the purpose of the window blind.

Project two, which is a multi-purpose strap curtain, made use of the same symbols in project one with a few additions. The additional symbolic elements used for project two include "Sankofa" which means learn from the past; "Bese Saka" which represents affluence, abundance, and unity, and cowries known as 'Sedeɛ' (a shell that was universally used as a currency in the fat human history. cowries possess certain features that make them valuable to use as decoration, charm, divination, and in games (a pawn in chess). Colours used for project two include wine for the fabric slats, tinted yellow and golden yellow yarns for stitching the pieces onto the fabric slats, and dark brown which is the colour of the moulded leather. These colours have similar significance as the ones combined in project one.

The outfit of the curtain depicts a welcoming entrance to a high-status edifice. This makes it suitable for use as a room divider for a dining hall or as a pub curtain for a hotel. The shape of the curtain is such that it projects a one-point perspective at the central part due to the systematically dropping length of the slats from the extreme ends to the middle. This suggests an advancing end of the space head that makes the viewer long for the approach.

4.3. Physiological Considerations of the Project Work

Another important aspect of the study worthy of discussion is the physiological consideration of the project vise-a-vise the properties of the materials used. Generally, all textile materials for curtains and blinds have consideration for the effects of sunlight, this is not different when it comes to the application of leather for the same purpose. This and other concerns such as the effect of heat, fire, and fungal growth are issues that came to light in the study. However, it is a fantastic material with excellent physical properties that can withstand these matters.

Leather is resistant to fungal growth such as mildew. Leather also consists of many fibers that are breathable. This breathability property of leather makes it possible to control the tendency of heat generation as far as the study is concerned. The fabric used for the integration (Tarpaulin) was also considered in terms of suitability. Tarpaulin has resistance to heat and light. Apart from that, it was piled in three folds to make it more absorbent to heat from the sunshine. The stack also makes the fabric firm enough to assist the operation of the blind. In the case of the strap curtain where flexibility is required, the fabric was not piled. Yarns used for the stitching of the moulded leather onto the fabric straps are made of rayon which has reliable proof of durability as much as the weather or physiological concerns are involved. Other materials such as plastic pebbles, disintegrated bamboo sticks, cowries, and trimmings are all weatherproof.

4.4. Care and Maintenance

Care and maintenance of curtains and blinds are generally not a big deal since they could be used for a long time without cleaning. Care and maintenance however depend on the type of material used for the product. The curtain and blind produced in this study consist of materials that require dusting or dry-cleaning. Polishing may also be done occasionally at most once a year to sustain the brilliant appeal of the leather portions in the work. Washing is not advisable since soap and detergent contain alkaline which may have an adverse effect on protein materials such as the natural leather used in this study.

4.5. Comparative Analysis of the Product over the Imported Ones

In terms of finishing aesthetics and mode of production, imported window blinds and curtains may seem to have some advantages over the products in the study. However, these factors are not enough to debunk the purpose of the study. The window blinds and curtains in this study have real features that portray the Ghanaians' cultural values and identity. The works have the quality and the capability of promoting, sustaining, and preserving the cultural heritage of the Ghanaians. The products exhibit a touch of royalty which is absent in the imported ones. The elements used in the designs are meaningful to the Ghanaian and therefore would have no psychological effect on users, rather, it would help transfer the Ghanaian philosophy and ideology to the young ones. In sum, the products in Figure 32 outfit are kind that project the principles, ideology, and philosophies of the people of Ghana.

Source: Studio work, 2015

Figure 32. The symbolic curtain and blind displayed.

5. Conclusions and Recommendations

5.1. Conclusions

The object of this study has been to produce Ghanaians' symbolic curtains and blinds by integrating "cuir bouilli" and applique techniques on fabric. In order to accomplish this charge, a number of activities including the observation of the types of leather, curtains, and window blinds on the Ghanaian market; and studio practices to explore the possible means of integrating "ciur bouilli" and applique on fabrics were conducted. The aim of this production sought to project the Ghanaian culture and ideology through window blinds and curtains in order to help disabuse the minds of vulnerable Ghanaians from the kind of images seen in some imported curtains and blinds. The outcome of the study has been unique products with remarkable ideology and aesthetic appeal that commands the attention of viewers. One interesting aspect is the protruding nature of the patterns seen in the works. They were projected in relief like the object in the "batakari kese" (Ghanaian traditional smock).

The designs were based on "adinkra" symbols which have significant meanings in Ghanaian society. For instance, a symbol known as "ese ne tekrema" connote friendship and interdependence among a group of people in society. As a design in curtains and blinds for hotels, the symbol was meant to project a cordial relationship among customers. Another aspect worthy of note is the successful integration of non-conventional textile materials like local leather, cowries, plastic pebbles, and bamboo in the project. These materials play important roles as components of the project. For instance, the embellishment of the strap curtain was more or less based on the beads produced by these unconventional textile materials. Since these items play various roles in Ghanaian life, it makes the window blind and curtain produced in this study kinds that are truly Ghanaian.

In all, the study revealed that locally produced leather from sheep and goat skins could be moulded or manipulated with "cuir bouilli" technique to produce forms of patterns suitable for use as applique designs in curtains and blinds. It also provides opportunities for students and artisans to explore the potential of integrating moulded leather and fabric for other artifacts.

5.2. Recommendations

After a careful analysis of the procedures and challenges of the study, the following recommendations have been outlined for consideration:

i. The textile designers in Ghana should consider adding Ghanaian symbolic curtain products to their main line of production in order to improve the promotion of the cultural heritage of the nation.

ii. Leather and fabric artisans should grab these innovative techniques in producing symbolic curtains and blinds so as to expand their scope, and explore other techniques to provide a wide range of varieties of Ghanaian symbolic curtains and blinds.

iii. It is highly recommended that such innovative art pieces should be showcased to stimulate students' interest and urge them to embark on similar or more thought-provoking endeavors in the realms of textile design.

iv. Government institutions and cooperate entities should embrace and patronize innovative products like the Ghanaian symbolic curtains and blind in order to sustain the efforts exerted by visionaries.

References

[1] Farlex, (2012). *Window blinds.* The Free Dictionary.

[2] Cooperative Extension Service, (2020). *Window treatment trends.* College of Agriculture, UK.

[3] Wu, Y. & Flemmer, C. (2020). Glass curtain wall technology and sustainability in commercial buildings in Auckland, New Zealand. *International Journal of Built Environment and Sustainability, 7* (2), 57-65.

[4] Acquaye, R. (2018). From tradition to innovation: Indigenous west African textiles in creative interior application. *American Journal of Art and Design, 3* (2), 18-25.

[5] Campo, S., Gatti, E. & Malan, O. L. (2019). Human-centred design. Accelerating results for every child by design. UNICEF.

[6] IDEO, (2015). *The field guide to human centred designs* (1st Edition). IDEO, Burns, C. (2018). *Human-centered design.* View Publication Stat.

[7] Victoria State Government, (2020). *Human-centred design playbook.* Department of Premier and Cabinet Digital, Design and Innovation.

[8] Stanford Social Innovation Review (2010). *An introduction to human-centered design.* Stanford Social Innovation Review.

[9] Adom, D., Asante, E. A. & Kquofi, S. (2016). Adinkra: An epitome of Asante philosophy and history. *Research on Humanities and Social Sciences, 6,* 42-53.

[10] Kisi, S. B., Fening, P. A. & Asante, E. A. (2019). The philosophy of adinkra symbols in Asante textiles, jewellery and other art forms. *Journal of Asian Scientific Research, 9* (4), 29-39.

[11] Aboagyewaa-Ntiri, A. Campion, C. B. & Kemevor, A. K. (2018). Extension of knowledge on Ghanaian adinkra symbols in relation to Maslow's theory. *International Journal of African Society Culture and Tradition, 6* (2), 25-38.

[12] Adom, D., Opoku, M., Newton, J. P. & Yeboah, A. (2018). Adinkra cultural symbols for environmental sustainability education in Ghana. *World Environment, 8* (2), 36-46.