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Technology Adaptation and Its Effect on Asante Traditional Textiles

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Abstract:

The role of technology in textile design and production cannot be over accentuated. Since the inception of textile art in the Asante region of Ghana, the traditional textile artisans have depended largely on technology to design and produce their products. There is, however an observed shift in the kind of technology used by the indigenous textile artists in the design and production of their works. The gradual transfer of technology from very indigenous to contemporary ones has, to some extent influence the nature of designs and products done by the textile artists. As Textile Designers and Scholars in Art, it behoves on us to study how this review of technology has affected the indigenous textiles of Asante. This would ensure an effective documentation of the design transition of Asante's textiles. The study adopted the qualitative research method and used mainly interviews and observations as its research tools. Primary data were collected from producers of Asante traditional textiles, distributors of traditional textiles and knowledgeable elders of Asante culture and traditional textiles. The study revealed that in spite of the observed revision in the technology of traditional Asante textiles, the socio-political roles and symbolism of the traditional textiles have still survived. It is recommended that contemporary technology be carefully fused with the traditional ones to ensure that the Asante traditional textiles meet the international standards and yet not compromise on the cultural and symbolic values embedded in the artefacts.

Keywords: Technology adaptation, documentation, indigenous, contemporary, traditional textiles, design, production techniques.

1. Introduction

The traditional textiles are among one of Africa's most significant colourful craft forms. These bright, colourful fabrics and intricate patterns have been incorporated into these clothing and home decorations through the development of different dyes and techniques (Asmah, 2004). Subject to the type of textile these patterns are woven, printed, dyed, or drawn onto the fabric. Like many other African countries, Ghanaian textiles best known to the world are the Kente, Adinkra and the embroidered cloth. Asante traditional textiles are either printed, woven or dyed and can be found in every traditional clothing shops in Ghana (Asmah, 2004). The printed, woven, dyed and embroidered cloths, all have taken advantage of the technology adaptation to produce vast and varied quantities of cloth, though the socio-political roles and symbolism of the traditional textiles remains the same or better still enhanced. The adoption of these technologies became evident after Ghana's independence in 1957 but these adaptations might have begun when the Europeans entered the shores of Ghana (Asmah, 2014).

A lot of innovative technological adaptation has been employed over the years to improve and strengthen traditional textiles and have become increasingly necessary to assess and document its impact on Asante traditional textiles. In this context, the economic, cultural or social impact of such experiences exclusively affects the individual and directly to the community due to its cultural complexities (Rusu, 2012).

Much as Asante traditional textiles have progressed from being primarily reserved for traditional rulers for special occasions, to an occasion for casual wear staple, its utilization is growing both within and outside the African continent. The interest in the use of these fabrics stems more from the improved attractiveness due to technology adaptation as opposed to cultural factors or internet publicity which has been significant in the dissemination of the trend in Ghana (Aboagyewaa-Ntiri, 2013 & Asmah, 2014). Other factors include

the National Friday Wear Programme introduced by the government in 2004 and the co-operation between traditional textile producers and fashion designers (Asmah, 2014).

The degree of adaptation of new and ancient technologies both to the requirements of the industry and the need to develop the creativity of a new generation of artists and designers, through the merger of various principles of textile science and technology, material and information science for sustainable society cannot be overemphasized (Rusu, 2012). He further reiterates that Textile designers, printers and weavers as well turn to tradition from the point of view of new technologies, they use traditional technologies to shape new ones. These groups of Ghanaian textile artists have a better understanding of the role of cultural background or tradition in the process of creation since the notion is that tradition and nature are often the keepers of perfect solutions (Rusu, 2012 & Asmah, 2014).

2. Methodology

2.1. Research Design

The descriptive, narrative and analytical methods of research were adopted for the study. This involved observation and interviews with selected and knowledgeable traditional weavers of *Bonwire* and that of *Ntonso* and *Tewobaabi*. For the narrative and analytic method, personal interview was held with the *Kentehene Nana Akwasi Gyamfi* and a council member at *Bonwire* and chief of *Tewobaabi*, *Nana Kwaku Duah II*. The interviews were based on unstructured questionnaire that was personally administered to the respondents at their convenience. Interviewing was restricted to weavers of *Bonwire* and printers of *Ntonso* and *Tewobaabi*. The expository research design was used to allow for a clear description of the phenomenon of innovation in *Kente*, embroidery, *Adinkra* symbol and designs. Traditional technology can be seen in the processing of yarns, dyeing of yarns, tools and equipment for weaving, the weaving processes, design application, printing and embroidering processes.

2.2. Yarn Production and Its Preparation

In man's quest to cover his nakedness, leaves, animal skin some of which were joined to obtain sizeable ones were used to conceal most part of the body. Later developments in Ghana introduced a tree bark beaten into a body covering material locally referred to as "*Kyenkyen*" (*Antiaris Africana*) a tree which grows in most parts of the tropics (Sackey, 1995). He continued that the stripe bark of this tree was peeled from the main stem, softened in water and then beaten with wooden mallets to loosen the cellulose into a naturally woven raffia-like fabric; interlaced to about three times the original width. It was then dried in the sun and made ready for use as a loincloth during the day and bed cloth during the night.

According to Picton & Mack (1979) the felted tree bark filled an analogous role as an antecedent of woven cloth. He further explained that two or three *kyenkyen* cloths though not woven on the loom was twisted and sewn together with the hand with thorns or palm nuts as needle and sewing threads prepared from retted pineapple leaves or thin strands of *kyenkyen*. This was done for women to cover their babies on their back and as wadding cloth by nursing mothers. Woven fabrics according to Joseph Sackey took over from skins and tree barks when man learnt to settle into communities and domesticated animals. Furthermore, he concluded that as man cultivated cotton, its fibres were spun into yarns and early hair fibres of domesticated animals were also spun into yarns.

Agreeing with Joseph Sackey (1995); Picton & Mack (1979), cotton yarn were spun from the mass of fibres surrounding the seeds of the cotton plant of which there are over 50 species of cotton plants (genus *Gossypium*) which produce fibres of different qualities in respect of physical properties which enable suitable spinning. They further indicated that until the eleventh century AD little was certain about the cultivation or use of cotton in Africa. According to Joyce Storey (1992); Joseph Sackey (1995) the principal cotton growing areas are Egypt, the Southern United States, the India, Brazil, and the West African countries including Ghana which produces poorer qualities. To Chalfin, (2001) cotton is grown in the interior and coastal savannah zones of Ghana but not on an extensive scale.

He further indicated that the Northern Region down to *Hohoe*, the Accra plains, the Upper Ashanti region, around *Ejira*, some parts of the *Brong Ahafo* region, from *Techiman* to *Wenchi* and the whole of the Northern and Upper region constitute the cotton growing areas in Ghana. However the Northern and Upper Regions lead in cotton production in Ghana. Chalfin, (2001) indicates that women and children in Ghana are the main labour force employed for harvesting the cotton ball and it is known as picking. Cotton fibres from the "lint" state to the yarn state undergo various processes such as Ginning or Cleaning of cotton to remove all impurities, blowing out of the lint, rowing and spinning. Chalfin, (2001) agrees with John Picton and John Mack (1979) on the process of ginning. John Picton and John Mack (1979) further states that local ginning can be done by placing them on a block of wood or even a flat stone where the seeds are squeezed out by rolling an iron or sometimes a wooden rod over them. The fibres then untangle (this can be done simply by loosening the balls by hand, although bowing is the usual method).

Joyce Storey (1992) indicates that due to industrial technology, the raw cotton is sent to the industrial ginning machine where the lint is separated from the seed after the burrs, sticks, crushed leaves and other dirt that are mixed up with the fibre are separated. He further indicates that the bales of cotton on arrival at the mill go through the following series of processes; opening-up and picking forming it into a sheet of about forty-five inches (45") wide known as a lap, which is fed into a carding machine consisting of a revolving spiked cylinder which comb high-quality cotton and draws the combed cotton into smaller and smaller strands. This is finally slightly twisted together prior to spinning, an indication of technology adaptation. The raw materials used now in Ghana are normally machine-spun cotton, hand-spun cotton, rayon and silk. Earlier on, the supply of cotton had been hand-spun cotton from the north and parts of the Volta region. In this contemporary era, local artisans depend mostly on factory produced yarns, and imported yarns from outside.

2.3. Warping Processes for Weaving on Loom

Warping is the process where many long threads are put together to form the yarn that run lengthwise in a woven fabric. Initially weavers drove pegs into the ground and moved with their warp yarns to and from these pegs till they obtained the total length and number of ends required. (Figure1a)

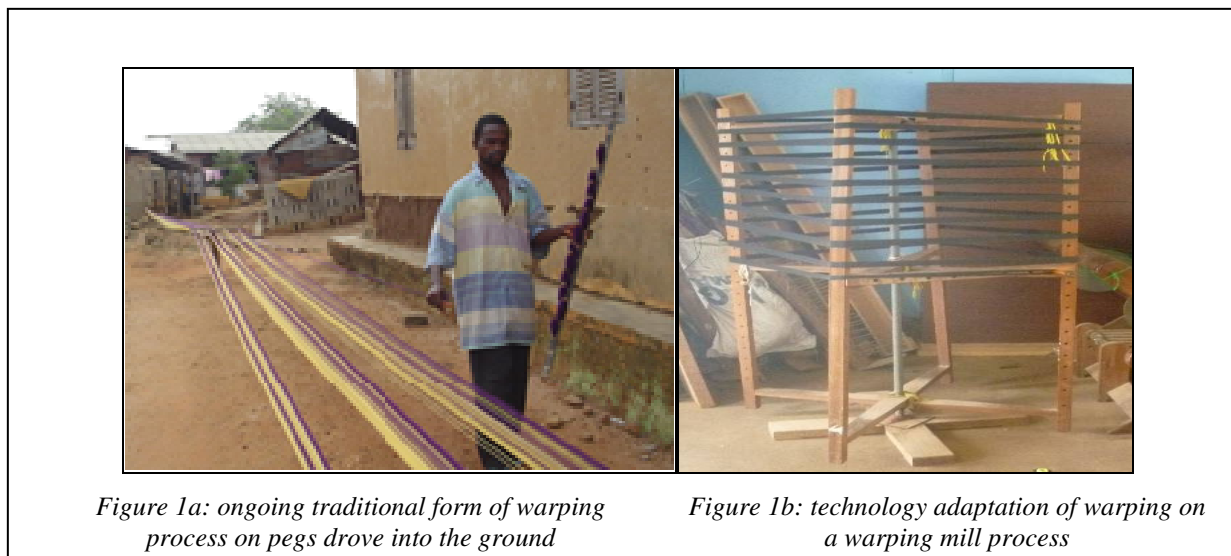


Figure 1a: ongoing traditional form of warping process on pegs drove into the ground

Figure 1b: technology adaptation of warping on a warping mill process

Figure 1

The traditional weavers in Bonwire still practice this system of warping (Figure1a), which has been identified as one of the most difficult and cumbersome tasks in the weaving process. To avoid this hectic task, different methods like the warping board or the warping frame, and the warping mill (Figure1b) were introduced. These two methods help in three different ways when preparing the warp. They help to align the warp yarn in parallel formation and support them with the characteristics crosses that every warp needs to avoid the problems of entanglement in the warp during weaving. For longer warps the warping mill proves to be ideal. When warping, the warp yarns are guided by one of the weaver’s hands while the other hand, turns the warping mill in both clockwise and anti-clockwise directions with the weaver remaining stationary. These are preferably used in institutions such as secondary schools and universities due to cost of warp board or warp mill construction.

2.4. Loom Modifications

There are various types of loom constructions: According to (Asmah, 2004), the first loom ever used among the Ashanti’s was called ‘Ayasedua” (Figure 2a) to produce a Kente called “Ayasentoma” (Ayaase is the Akan name used to describe the groin or that part of the body between the belly and the thigh). He further described the loom as small and triangular, placed on the thigh during weaving and could be classified in this present day as a table loom due to its size and how it is placed during working.

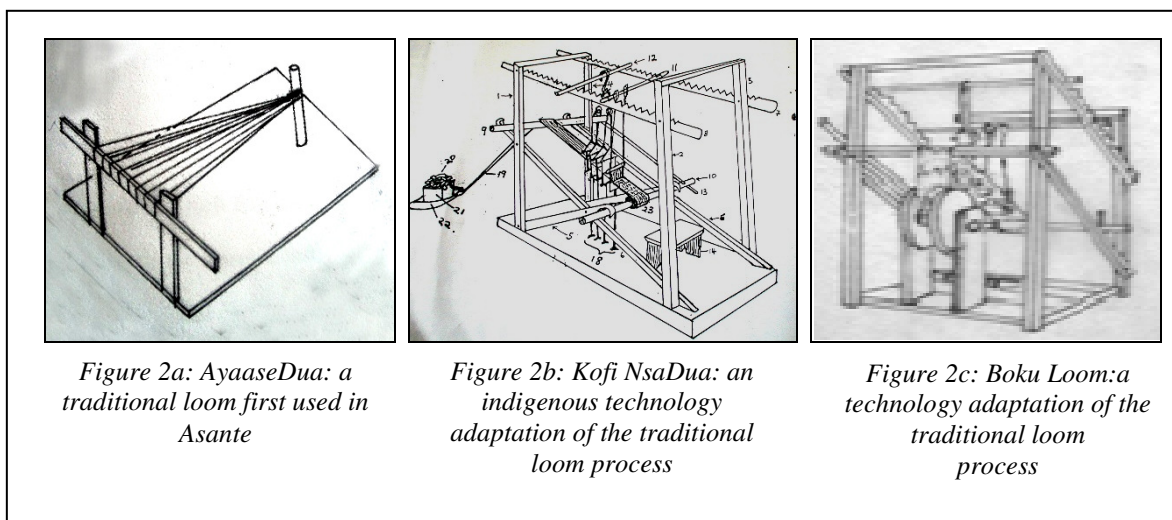


Figure 2a: AyaaseDua: a traditional loom first used in Asante

Figure 2b: Kofi NsaDua: an indigenous technology adaptation of the traditional loom process

Figure 2c: Boku Loom: a technology adaptation of the traditional loom process

Figure 2

He further continued that the “*Asasedua*” which was used to produce “*AsaseNtoma*” was the second loom to evolve. This was an improvement upon the “*AyaseDua*” but rather bigger and fixed to the ground (*Asase* means earth in Akan dialect) so it could be used in producing bigger fabrics. In Asmah’s description the “*Asasedua*” was operated by two people while one creates a shed, the other inserts the weft and did the beat-up. This was done while standing and seems very tiring. This was improved into a version known as “*Nsaduaso*” which was used to produce “*NsaduaNtoma*”. He further indicated that only one person did the weaving and even in a relaxed manner thus sitting while weaving. It was bigger than the “*Asasedua*” and used to produce “*Gagauge*” a cloth that was presented to *Nana Osei Tutu I*. He concluded that the fourth loom that evolved was known as “*Kofi NsaDua*” (Figure2b). This He said came as a result of *Ota Kraban* who on his return from *Gyaman* in Ivory Coast modified the *Nsadua* which he completed its construction on a Friday hence the name “*Kofi Nsadua*” or “*Nsadua Kofi*”.

The *Boku* loom (Figure2c) produced by Mr. Lionel *Idan*, the initiator of Integrated Rural Art and Industry in KNUST Kumasi. He named it after one of his sons called *Boku*, which was a remarkable improvement upon the traditional looms for both the Asante and the Ewe community. The shortcomings that characterized “*Kofi Nsadua*” were minimized if not eliminated to enhance easy weaving of the rich *Kente*. This loom designed addressed the following issues such as: time wasting during pre-weaving and weaving operations, reduced the excessive stretch of the warp beam, and the elimination of the drag weight called *Twesooso* as to save factory space. Eliminating the weaving adjustments of getting up, moving from the cloth-end of the loom to the warp-end of the loom to loosen up a primitive locking device, roll about 30cm of warp at the cloth-end of the loom, returning to the warp-end to lock up the locking device again and finally, resuming his seat to continue weaving after every 20cm of weaving. The narrow size of reed that produces a narrow stole, which makes it difficult to produce wide pieces for a full cloth, in the shortest possible time was broadened. Warp entanglement during weaving with the warp yarns was also eliminated to reduce the frustrations of the weaver (Asmah, 2004).

2.5. Progression of Adinkra Technology Adaptation

In the area of Adinkra technology, the expository design study was adopted in this section of the paper. Goddard & Melville, (2007) explained that this type of research is created basically on existing information and through intensive reading on the field; in this way, a researcher can often advance an important new insight. With this in mind, pictures of designs and written text have been clearly used to explain each stage as illustrations are as important as written text.

2.6. Preparation of Adinkra Dye

Initially, to prepare the *Adinkra dye (duro)*, the bark of the tree was steeped and soaked in water for 3 to 5 days. This was further beaten to make it very soft to enhance extraction during boil. Dark liquor was the result achieved (Figure 3a). This was drained off and boiled again with several bumps of iron fillings. Rattray, (1927), analysed the quantity of iron fillings used in making an Adinkra dye as follows: Carbonaceous matter - 0.16%, Silica - 9.60%, Ferric oxide - 89.0% and Magnesium oxide - 1.24%.

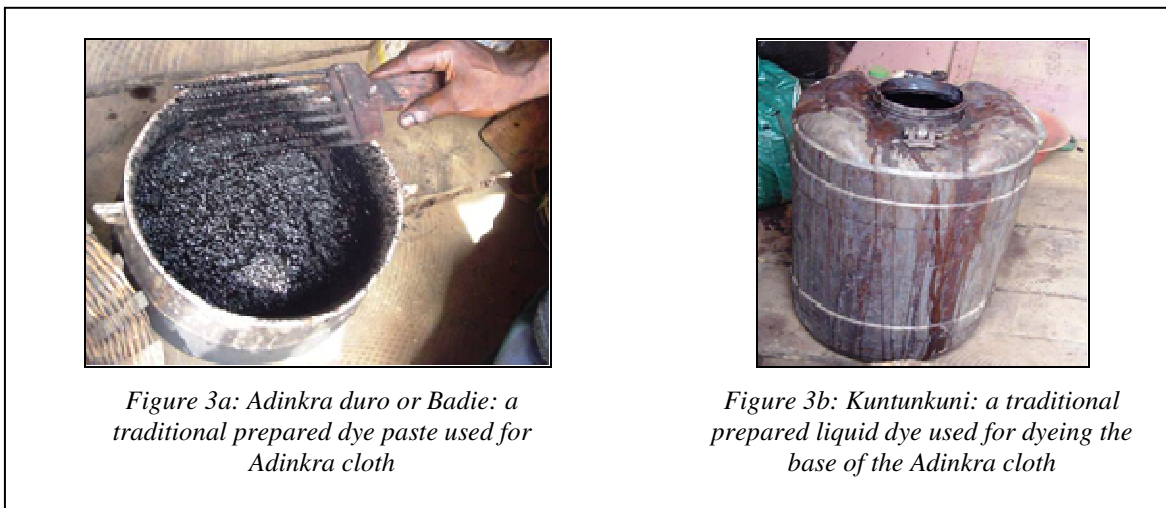


Figure 3

The vegetable dye is obtained by treating the bark of a tree botanically known as *Rhodognaphalonbrevicuspe* (local name: *Kuntunkuni*- Figure 3b) (Kwami, 1994 and Asmah, 2004). The dye is insoluble in water and is made soluble to possess direct affinity for the materials to be dyed by beating the bark of the tree and steeping it in water for about three to four days to allow it to ferment. This changes the insoluble “*kuntunkuni*” to soluble when extracted. To achieve this, a reasonable amount of water is poured on the fermented stuff in a big barrel and boiled for ten hours. It is then allowed to cool and the reddish brown dye liquor formed, drawn or collected into different dye bath. In producing the “*kuntunkuni*” cloth, the fabric to be dyed is soaked in a barrel containing the dye for over ten hours. Weights are then placed on the fabric to ensure total immersion. When the fabric is first removed, it appears like a yellowish brown colour, but when later exposed to the air, it takes its actual colour, black. If a darker colour is desired, the process is prolonged or reproduced.

Today, both synthetic and natural dyes are used in dyeing fabrics (mainly funeral cloths) at *Ntonso*. The natural plant species are obtained from *Rhodognaphalonbrevicuspe* (local name: *Kuntunkuni*) and *Brideliamicrantha* (local name: *Badie*) are brought to *Ntonso* from the forest-savanna transitional zone of Ghana (Asmah, 2004 and Acquah, & Oduro, 2013). Currently, the dyers use only red and black coloured-dyes for dyeing the funeral cloths. The black dye is obtained from the root of the *Kuntunkuni* tree. The bark of the *Badie* tree produces a dark-brown coloured dye. These natural dyes (*Kuntunkuni* and *Badie*) are mixed with a black synthetic dye for dyeing the funeral cloths. In some instances, only *Kuntunkuni* and the black synthetic dye are mixed. The addition of the black synthetic dye is to increase the colour intensity which demonstrates a technology adaptation (Asmah, 2004 and Acquah, & Oduro, 2013).

For non-availability of any tree species that produces a red coloured dye, red funeral cloths are currently dyed using only red synthetic vat dyes or indigo vat dyes. This type of dyeing is done by the cold dye method. The dye is dissolved in water and the fabric placed in it for over 3 to 5 days. The fabric is then removed when the dyeing liquor becomes clear (Asmah, 2004). However, with the advent of using purely synthetic dyes and print paste for printing, Adinkra cloth is now produced with ease and have become fast to washing unlike the original Adinkra cloth which fades easily as a result of the natural organic paste used without any fixation.

2.7. Transfer of Adinkra symbols on Today's Fabric

The native Adinkra cloth involves the printing of Adinkra symbols and other designs with a black dye (*Adinkra duro*) using stamps carved from calabash pieces (Figure 5a). Currently, the printing of Adinkra cloth has seen the use of screen printing techniques (Figure 5b) together with acrylic based synthetic printing pastes instead of calabash stamps with *Adinkra duro* (Figure 4a). This technique, obviously a foreign influence employs the use of work benches raised well above the ground to enable a person of average height work comfortably while standing (Figure 6b) instead of kneeling (Figure 6a). A flat piece of wood converted into a squeegee is now used to draw the acrylic paste across the design area thus transferring the design onto the cloth. This development has greatly impacted on the production of Adinkra cloths, reducing the production time and augmenting the accuracy of design registration.

Although comb printing is widely used in the printing of Adinkra cloths, the introduction of screen and block stamp has invariably minimised use of the comb to print rectilinear grids which first divide the base fabric into segments for easy and precise stamping of the Adinkra symbols. Designs can be easily registered without the help of a comb-brushed rectilinear grids (Figure 4b). Adinkra cloths are also printed with an automated industrialized printing machine which imitates the indigenous design on a mill-woven fabric. With this, large yards of Adinkra cloth are produced within a very short time, contrary to the calabash or block stamp ones which take a longer time to produce. Today, other types of printing are used with the same Adinkra motifs. Batik (resist method) is used with other methods to produce interesting Adinkra cloths. This is a new development in the area of Adinkra cloth printing.



Figure 4a: a traditional Calabash stamping with Adinkra dye paste used for Adinkra cloth



Figure 4b: a traditional way of designing using the wooden comb for linear markings on Adinkra cloth

Figure 4



Figure 5a: a traditional Calabash stamping used for Adinkra cloth



Figure 5b: a contemporary designed screen used for Adinkra cloth

Figure 5



Figure 6a: a traditional way of kneeling and printing during Adinkra cloth production



Figure 6b: a contemporary way of standing to print during Adinkra cloth production

Figure 6

Customarily, Adinkra symbols are stamped on dark–brown, black or red backgrounds, which are mainly used for most important funerary events. This however has changed due to the growing demand for Adinkra cloths for occasions such as thanksgiving, outdoorings and traditional event like “Akwasidea”. Adinkra designs are now produced in white and other vibrant background fabrics for all occasions. The demand for Adinkra cloth has brought about the variability of its production, which includes the use of modern technology in workshop production settings. Currently, they have taken on a more universal significance as an important and exclusive form of African textile artistry. The Adinkra cloth design has seen an increased growth in the use of blazingly threads in creating bigger Adinkra symbols repeatedly in combination with other distinctive motifs in printing (Figure 7a), batiks (Figure 9) or embroidery technique (Figure 7b) often in imported satin background or on a narrow strip woven fabrics.

Adinkra symbols continue to change as the new influences impact on Ghanaian culture as some of the symbols now record specific technological developments in the use of embroidery techniques (Figure 8) to register the symbolism fabric in a unique manner. With this, there is a slight deviation of the registered symbols from the indigenous symbols, thereby adding aesthetic effects to the cloth. For the aesthetic qualities of the artefact produced are not only a sum of the technique of colouration and symbolism in which they appear, but also the sum of transformations, as a result of interaction between the artist and its cultural environment.

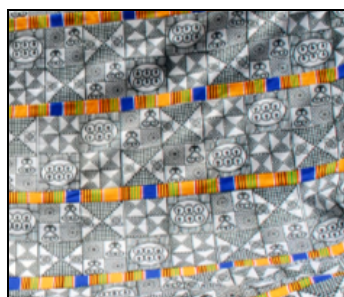


Figure 7a: a contemporary Adinkra print complemented with an “Nwomu” stripe

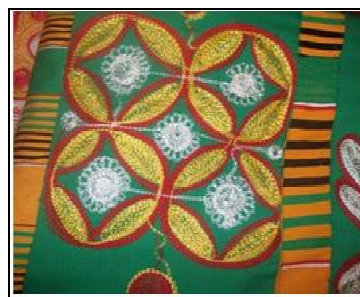


Figure 7b: A contemporary embroidered Adinkra cloth with Nwomu on both sides of the Adinkra symbol –Mpuannun.

Figure 7



Figure 8: a contemporary, fully embroidered Adinkra cloth being produced

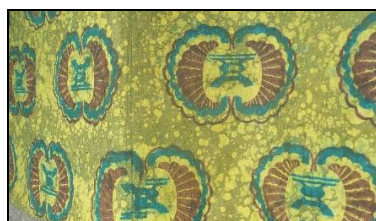


Figure 9: a contemporary Kanto batik print used as an interpretation of an Adinkra cloth (Asmah, 2004)

Nwomu is a needling technique with brightly coloured rayon yarn, which are arranged longitudinally, one lying next to the other to form bands of colour over a narrow width extending along the length of the cloth. Today, the traditional Adinkra cloth has been replicated with roller-printed machine to produce Adinkra cloth designs with modification and in varied colours.

Traditional Asante textiles is still considered sacred and worn exclusively by royalty and spiritual leaders, especially when the design or weave woven is completely new to the general public; as the popular adage goes 'the culture of the people should not be underrated'. These clothing's have their special place during sacred ceremonies, rituals, and funerals. Its significance, the role and importance cannot be over emphasized and should not be overlooked although some of these traditional textiles are technologically being adapted to speed up production processes and to enhance its aesthetic appearances. Traditional textile culture in Asante is still deeply rooted in societal values accelerated by the growing interest of the market forces and prompted by the rediscovery of designs inspired by traditional ideology. Despite these developments, traditional textiles is continuously sustaining the powerful metaphorical ingredients enshrined in various political and social-religious practices (Asmah, 2014).

Designers are now inspired to adapt the laser cut technology to produce unique Adinkra products in wood (Figure 12) and metals (Figure 10) and fabrics etc. This latest technology adaptation technique is in vogue, shows coming from the runways indicate that many fashion articles are cut with lasers and the demand for embroidered laser cut fabrics keeps on increasing (Aboagyewaa-Ntiri, 2013). Through technology adaptation, the application of Adinkra symbolism not only ends on fabrics, but on any item of material culture in the traditional Asante society. Wide range of household goods and ceremonial artefacts and even buildings reflects the technology adaptation in almost every facet of life. It is interesting, however, to note that the incorporation of Adinkra symbols in architecture has led to the evolution of a distinct Ashanti architectural style traditionally limited to public buildings (Figure 11) such as chief's palaces, fetish houses and homes of important community leaders (Kwami, 1994).



Figure 10: laser cut technology used to produce Adinkra metal

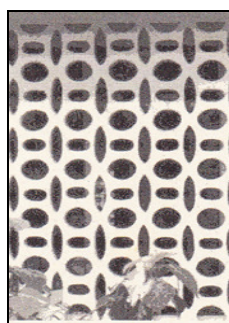


Figure 11: the use of Adinkra symbols in architecture



Figure 12: laser cut technology used to produce Adinkra wooden ear-ring

3. Conclusion

Traditional clothing's belongs to the community as it embraces the history and culture of the community and has the power to unite the populace as one nation. To adapt contemporary technology to make contemporary designed clothing from traditional technology serves as a continuity of culture. If Ghana and for that matter Asante's is to remain in the clothing trade, then being innovative and abreast with time is a necessity for its arts technologist (Jennings, 2011). The expertise and technology adaptation used today is as a result of past traditional technologies. Flexibility, in technology adaptation is a must for the contemporary textile artist or designer in a changing world where producers have the opportunity to switch from dogmatic and stagnant technological approach to a higher technological advancement in designing and production. The technology adaptation in traditional textiles, the socio-political roles of symbolism in traditional textiles and the economic drive symbolism have given to traditional textiles and other fields of fashionable art in the past still survive to some extent in today's Asante culture in spite of the various influences of such adaptation (Asmah, 2014).

The results of such adaptation are always profitable to the entire community as seen in *Ntonso* and *Bonwire* just to mention a few and in terms of patronage to the producer or by the consumer. The only drawback on the progress of the traditional dyeing industry at *Ntonso* is the limited range of plant species for the extraction of dyes. The dyers have, over the years, utilised only two tree species as sources of textile dyes. There are currently no plantations of these two species to ensure continuous supply of dyes. This has necessitated the use of synthetic dyes by the dyers (Acquah, & Oduro, 2013). Even though the traditional technology is still in effect, traditional textiles are more widely available today due to the introduction of new technology and the use of man-made dye. It is, however, recommended that contemporary technology be carefully fused with the traditional ones to ensure that the Asante traditional textiles meet the international standards and yet not compromise on the cultural and symbolic values embedded in the artefacts.

4. Acknowledgement

We would like to express our appreciation to *Kentehene of Bonwire*, *Nana Akwasi Gyamfi*, and chief of *Tewobaabi*, *Nana Kwaku Duah II.*, for their assistance and insight into the various production processes on Kente, Adinkra and the embroidered cloth.

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