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A Brief Studies on Block Printing Process in India

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I. INTRODUCTION

Hand Block Printing on textiles refers to the technique by which carved wooden blocks covered with dye are repeatedly pressed along a length of cloth to create patterns. The beginnings of the art of ornamenting textile fabrics by the stamping or printing on of colored designs are lost in antiquity. Block printing is believed to have originated in China towards early 3rd century. Around the 4th century, records of its presence were found in Egypt and some Asian countries from where it spread to Europe and other places. Block printing was first developed in China and is said to be over 2000 years old. However, the earliest known example is the Diamond Sutra from 868 AD which is currently in the British museum. Records show that as far back as the 12th century, several centers in the south, on the western and eastern coasts of India became renowned for their excellent printed cotton. On the southeastern coast the brush or kalam (pen) was used, and the resist applied by the same method. In the medieval age printing and dyeing of cottons was specially developed in Rajasthan. In Gujarat the use of wooden blocks for printing was more common. Tents were made from printed fabrics and soon they became necessary part of royal processions. The seasons largely influenced the integration of the highly creative processes of weaving, spinning, dyeing and printing. Festivals also dictated this activity. Block printing is a special form of printing first developed in China. The earliest known example with an actual date is a copy of the Diamond Sutra from 868 A.D (currently in the British Museum), though the practice of block printing is probably about two thousand years old Trade in cotton cloth is said to have existed between India and Babylon from Buddha's time. Printed and woven cloths traveled to Indonesia, Malaya and the Far East. In the 17th century, Surat was established as a prominent center for export of painted and printed calicos, covering an extensive range in quality. Cheaper printed cloth came from Ahmedabad and other centers, and strangely enough Sanganer was not such a famous center for printing as it is today.

II. TYPES OF BLOCK PRINTING

A. Ajarakh

The village of Dhamadka in Kutch is noted for their reversible prints, known as Ajarakh handloom textiles. Ajarakh is produced in Sindhi; Kutch, Gujarat; and Barmer, Rajasthan in India. These textiles featured geometric and floral patterns. The name is derived from 'azrak' the Arabic word for 'blue' , as indigo blue happens to be one of the predominant colours in Ajrak printing and it is one of the oldest printed fabric known to man. Woodblock printing gives rise to very geometric shapes and patterns. Vegetable dyes and other natural dyes are used for the process, and this garment is a symbol of the area's culture and heritage. This print uses motifs in

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intense colors like Black, yellow, crimson red, green and indigo blue (Blue and red are the most prominent and distinguishing colors of this print) and will also have motifs worked in white (unprinted) and black, usually as outline – the white and black defining the design. Ajarakh cloth is block printed by stamps on one or both sides. Co-ord Sets for Women: The Ultimate Fashion Trend to Elevate Your StyleWooden blocks engraved in geometric shapes and patterns are dipped in natural dyes and used in this process. Usually multiple colors are seen in the same fabric, with many different types of motifs, including border prints.

Ajrak has become a symbol of the Sindhi culture and traditions. Ajrakh is printed using a very complex method involving both resist and mordant techniques, and has a long process involving as many as 20-30 different steps of printing and washing the fabric over and over again with various natural dyes- A very labor intensive printing process indeed. The entire process can take up to two weeks resulting in the creation of the beautiful eye-catching pattern of the arak. This cloth was mainly used for turbans, lungis, shoulder cloths, womens skirts, stoles etc. Ajrakh cloth kurtas are in vogue but you'll also find bed sheets, pillow covers and table clothes in this fabric. Ajarakh cloth is also used as marriage wear by Muslim males.

B. Dabu

Dabu or daboo originates in Rajasthan and has survived the test of time with some difficulty and is a time-consuming printing technique involving many phases and a great amount of labour Supposedly.

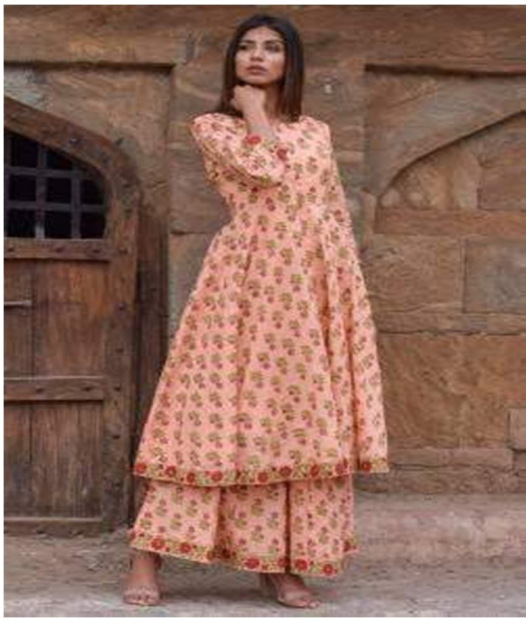
Dabu printing originated in China and eventually, Rajasthan became the most popular centre of it. Plants, flowers and different motifs are core components of this kind of block printing, and the technique is practiced in various villages in Rajasthan.

A very complicated process, it involves phases of washing, hand printing, use of mud resist and drying. To concise when the fabric is dyed, the places where the clay is applied and dried remains uncoloured. The designs are similar to the “batik” style of printing, but the techniques used for the two are vastly different.

C. Sanganer

Sanganer on the outskirts of Jaipur is a large centre for printing on fabrics. The Sanganeri hand block-printing industry is blessed with natural factors that support it, like water, sunshine, atmospheric humidity and the local herbs and flowers used in the printing process.

Today, Sanganer is filled with block makers and printers. Sanganeri Hand Block Prints are famous for their off white or pure white backgrounds.



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The designs are very intricate with fine lines with detailing. A hand printing technique which involves laying out of the material on tables and then printing using blocks with intricate designs. The fabric is marked before, so that alignment of symmetry of design is maintained. Sanganeri print bed sheets are pretty famous. This technique of printing is commonly seen on apparels and other objects of home décor. The block printing is done mainly for products such as saris, dupattas, salwar kameez and also sets, bedcover, curtains, scarves, and yardage for apparel and home.

D. Bagru

Bagru is one of the most well know hand block printing styles from Rajasthan, this printing technique is laborious but produces exquisite results. Its traditional processes of hand block printing on textiles with rich natural colours have been known for many centuries. Bagru Hand Block Printing now has a GIR tag associated with it. The process of Bagru printing is a long and cumbersome one that requires the “Chhipa” or the Printer to be exceptionally skilful as well as patient. “Chhipa” is the local word that refers to the printer as well as the community that is engaged in this craft. Washing, hard dyeing, drying and other parts form the core of the printing process. Blocks are placed from left to right and slammed hard on the fabric. The fabric is dried afterwards. They are then washed and boiled and finally rinsed to get the final product. The brightly coloured block printed fabrics from Bagru are used for apparel as well as home furnishings such as quilts, bedspreads, cushions and curtains.

Over 100 years old, this technique has beendeveloped by families and handed down traditionally in Rajasthan. Bagru block printing has been alive for centuries creating some of the best Indian prints. A tediously long process that involves creating wash resistant prints, the craft boasts of master craftsmen who have been dedicated to it for a long time. Exacting, but ultimately beautiful, the Bagru block printing technique is all natural, right from the dye to the wooden blocks and is celebrated all over the world for their simplicity and effortless elegance.

E. Gold & Silver Dust

A traditional form of printing, 'Chandi Ki Chhapai' or 'Silver Printing' is a delicate way of embellishing clothes or fabrics. Also called 'Varak Gold or Silver Leaf Printing', this kind of printing uses varaks made by flattening gold or silver into a thin paper-like consistency. These thin sheets of silver are also used to garnish Indian sweets.

III. PRINTING PROCESS

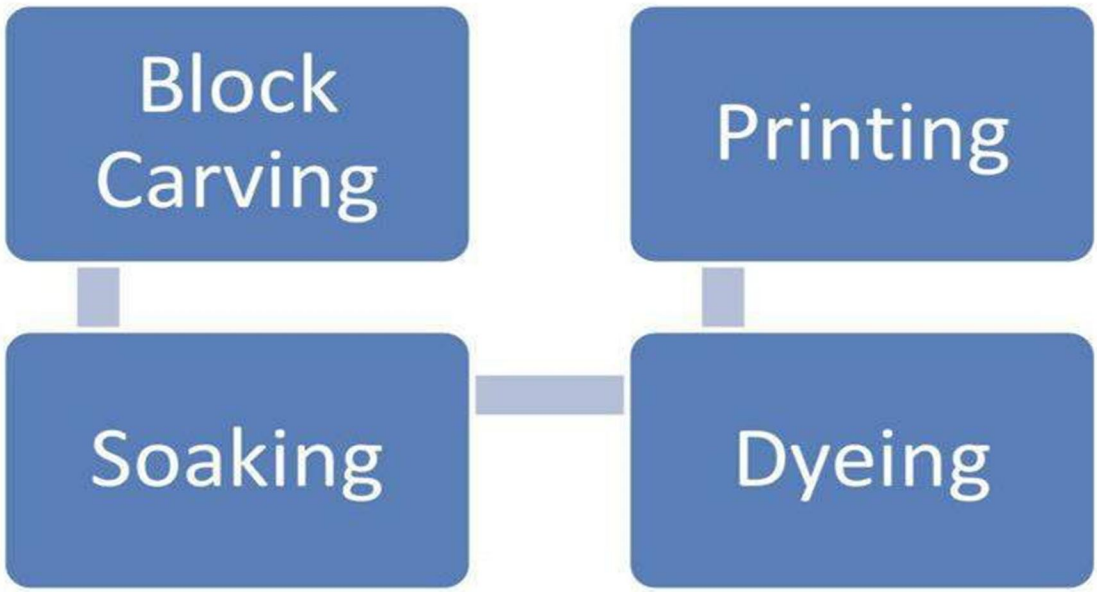

Fig. 1 – Process Flowchart

1) *Step 1:* First, the fabric to be printed is washed free of starch (size material) and soft bleached. If dyeing is required (as in the case of saris where borders or the body is dyed) it is done before printing. The fabric is again washed to remove excess dye and dried thoroughly.
2) *Step 2:* The fabric is stretched over the printing table and fastened with small pins. This is an important stage as there should be a uniform tension in the fabric with no ripples.


Fig 7: Step 1 – Desizing Process


Fig 8: Step 2 – Attachment of the fabric.


Fig 9: Step 3 – Preparation of colour and block


Fig 10: Step 4 – Preparation of colour tray.

3) *Step 3:* The dyes or the pigments to be used are kept ready for application
4) *Step4:* Under the pigment tray is another tray containing a thick viscous liquid made from pigment binder and glue. This gives the color tray a soft base which helps to spread color evenly on the wooden block. Small squeeze is used to spread the color paste over the tray.
5) *Step 5:* The printing starts from left to right. The color is evened out in the tray with a wedge of wood and the block dipped into the outline color (usually black or a dark color)


Fig 11: Step 5 – Printing over the cloth.


Fig 12: Step 6 – Printing of multi colour.


Fig 13: Step 7 – Curing with steam.


Fig 14: Step 1 – Preparation of the dye solution

6) *Step 6:* When the block is applied to the fabric, it is slammed hard with the fist on the back of the handle so that a good impression may register. If it is a multiple color design, the second printer dips his block in color again and prints on top of the outline made by the first block. The third color if required follows likewise, precisely aligning the block each time. Skill is necessary for good printing since the colors need to dovetail into the design to make it a composite whole.
7) *Step 7:* The fabric is sun-dried, which is part of the colour-fixing process. It is rolled in wads of newspapers to prevent the dye from adhering to other layers and steamed in boilers constructed for the purpose. Silks are also steamed this way after printing. After steaming, the material is washed thoroughly in large quantities of water and dried in the sun, after which it is finished by ironing out single layers, which fix the color permanently.

A. *Making Of Dye Paste And Color Tray*

1) *Step 1:* For making the color tray very first dye paste is prepared by mixing thickener, binder and dye. The dye paste should not be very thick (disadvantage: dye will not give even printing) or watery (disadvantage: dye paste will spread over the fabric).


Fig 15: Step 2 – Transfer of the dye solution


Fig 16: Step 3 – Placing of Tharthari.


Fig 18: Step 5 – Preparation of printing tray.

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2) *Step 2:* Now the tray (palia) is taken which is made of wood, generally the size of tray is 7 inches in breadth and 10inches in length and 2 inches deep but sometimes sizes can be varies according to size of block. Now, the dye paste is transferred to the tray (palia) from the bucket.
3) *Step 3:* After that put a net like square frame made of bamboo sticks called "THARTHARI" (bamboo sticks are tied with nylon thread in form of net)
4) *Step 4:* Level of the color will be equal to the level of tharthari on color tray.
5) *Step 5:* On the top of the jute fabric, mulmul fabric is kept and above mulmul, georgette fabric is kept, if we want design with les intricacy. If the block is more intricate, then above the jute fabric, georgette fabric is kept and above georgette, mulmul is kept.

B. How To Set The Table For Block Printing

The table is generally 4 ft wide and 15 ft long on which jute fabric called "Tat" is placed. Over the tat, blanket is placed. And on top of it, 2-3 layers of cotton fabric is placed. Above it, the fabric to be printed is kept. Then printing is carried out.

IV. METHOD AND EQUIPMENTS USED IN HAND BLOCK PRINTING

This process, though considered by some to be the most artistic, is the earliest, simplest and slowest of all methods of printing. The blocks may be made of box, lime, holly, sycamore, plane or pear wood, the latter three being most generally employed. They vary in size considerably, but must always be between two and three inches thick, otherwise they are liable to warping, which is additionally guarded against by backing the wood chosen with two or more pieces of cheaper wood, such as deal or pine. The several pieces or blocks are tongued and grooved to fit each other, and are then securely glued together, under pressure, into one solid block with the grain of each alternate piece running in a different direction. The block, being planed quite smooth and perfectly flat, next has the design drawn upon, or transferred to it. This latter is effected by rubbing off, upon its flat surface, a tracing in lampblack and oil, of the outlines of the masses of the design. The portions to be left in relief are then tinted, between their outlines, an ammoniacal carmine or magenta, for the purpose of distinguishing them from those portions that have to be cut away. As a separate block is required for each distinct color in the design, a separate tracing must be made of each and transferred (or put on as it a termed) to its own special block.

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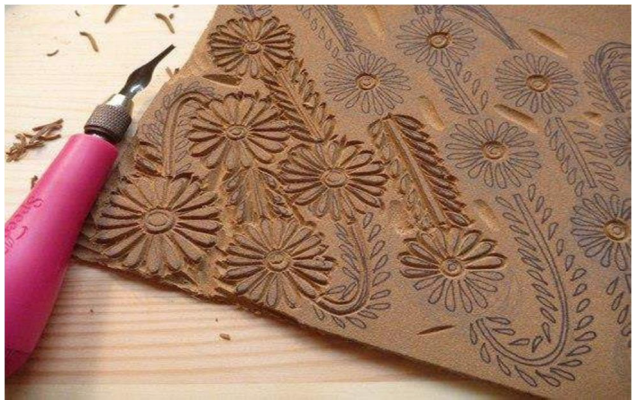
Having thus received a tracing of the pattern the block is thoroughly damped and kept in this condition by being covered with wet cloths during the whole process of cutting. The block cutter commences by carving out the wood around the heavier masses first, leaving the finer and more delicate work until the last so as to avoid any risk of injuring it during the cutting of the coarser parts. When large masses of color occur in a pattern, the corresponding parts on the block are usually cut in outline, the object being filled in between the outlines with felt, which not only absorbs the color better, but gives a much more even impression than it is possible to obtain with a large surface of wood. When finished, the block presents the appearance of flat relief carving, the design standing out like letterpress type.

Fine details are very difficult to cut in wood, and, even when successfully cut, wear down very rapidly or break off in printing. They are therefore almost invariably built up in strips of brass or copper, bent to shape and driven edgewise into the flat surface of the block. This method is known as coppering, and by its means many delicate little forms, such as stars, rosettes and fine spots can be printed, which would otherwise be quite impossible to produce by hand or machine block printing. Frequently, too, the process of coppering is used for the purpose of making a mold, from which an entire block can be made and duplicated as often as desired, by casting. In this case the metal strips are driven to a predetermined depth into the face of a piece of lime-wood cut across the grain, and, when the whole design is completed in this way, the block is placed, metal face downwards in a tray of molten type-metal or solder, which transmits sufficient heat to the inserted portions of the strips of copper to enable them to carbonize the wood immediately in contact with them and, at the same time, firmly attaches itself to the outstanding portions.

When cold a slight tap with a hammer on the back of the lime wood block easily detaches the cake of the type-metal or alloy and along with it, of course, the strips of copper to which it is firmly soldered, leaving a matrix, or mold, in wood of the original design. The casting is made in an alloy of low melting-point, anti, after cooling, is filed or ground until all its projections are of the same height and perfectly smooth, after which it is screwed on to a wooden support and is ready for printing. Similar molds are also made by burning out the lines of the pattern with a red-hot steel punch, capable of being raised or lowered at will, and under which the block is moved about by hand along the lines of the pattern. In addition to the engraved block, a printing table and color sieve are required. The table consists of a stout framework of wood or iron supporting a thick slab of stone varying in size according to the width of cloth to be printed.

Over the stone table top a thick piece of woolen printers blanket is tightly stretched to supply the elasticity necessary to give the block every chance of making a good impression on the cloth. At one end, the table is provided with a couple of iron brackets to carry the roll of cloth to be printed and, at the other, a series of guide rollers, extending to the ceiling, are arranged for the purpose of suspending and drying the newly printed goods. The color sieve consists of a tub (known as the swimming tub) half filled with starch paste, On the surface of which floats a frame covered at the bottom with a tightly stretched piece Of mackintosh or oiled calico.



On this the color sieve proper, a frame similar to, the last but covered with fine woolen doth, is placed, and forms when in position a sort of elastic color trough over the bottom of which the color is spread evenly with a brush.

V. DYES USED IN BLOCK PRINTING

A. Pigment Dyes

Pigment colors are mixed with kerosene and a binder. The consistency should be just right, for if it is too thick it gives a raised effect on the material, which spoils the design. Small plastic buckets with lids are ideal for storing the mixed colors for a few days. The motif is printed directly on white or light-colored ground with a variety of pigment colors. Pigment colors are widely popular today because the process is simple, the mixed colors can be stored for a period of time, subtle nuances of colors are possible, and new shades evolve with the mixing of two or three colors. Also the colors are visible as one prints and do not change after processing. Colors can be tested before printing by merely applying it onto the fabric. The pigment color is made up of tiny particles, which do not dissolve entirely and hence are deposited on the cloth surface while rapid dyes and indigo sols penetrate the cloth.

B. Rapid Fast Colors

In this process, the ground color and the color in the design are printed on white and/or light-colored grounds in one step. The dyes once mixed for printing have to be used the same day. Standard colors are black, red, orange, brown and mustard. Color variation is somewhat difficult and while printing it is not possible to gauge the quality or depth of color.

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C. Indigo Sols

It is mainly for cotton. The dye easily penetrates through the fabric. The fastness property of the dye is good

D. Discharge Dyes

These dyes are used if you need to print onto a dark background. Medium to dark grounds are dyed on fabric with specially prepared dyestuff. The printing colors then used on the fabric contain a chemical that interacts with the dye.

This interaction simultaneously bleaches the color from the dyed ground and prints the desired color on ts place. Areas can also be discharged and left white. The primary advantage of this process is that vivid and bright colors along with white can be printed on top of medium and dark grounds.

E. Napthol Reactive Dyes

As the name suggests, these are two sets of chemicals, which upon reaction produce a third chemical essentially colorful in nature. Fabric is dyed in one and later printed with the other. The chemical reaction produces a third color. However, the biggest drawback of this process is that there are just a few chemicals available, which produce colors upon reaction

F. Bagru Black

This is derived by mixing acidic solution of iron - often rusted nails/horse shoes etc. with jaggery (country sugar) allowed to rot for about 10-15 days. Many other natural substances used for producing dyes are pomegranate skins, bark of mango tree, vinegar, slaked lime etc.

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G. Bagru Red

This dye is achieved by combining a source material such as alizarin with alum, the results ranging from pink to deep red.

H. Indigo Blue

The internationally famous Bagru Blue is obtained from the indigo bush found throughout India

VI. SWOT ANALYSIS OF BLOCK PRINTING INDUSTRY IN INDIA

A. Strength

1) Traditional printing technique.
2) Explorations in the designs are always done according to the need.
3) Practiced in many clusters all over India.
4) The traditional block printing craft has flourished over the past three decades, with increasing demand from both export and domestic markets
5) A large mass of people are involved in this business.
6) India is one of the largest manufacturers and exporters of block printed fabric in the world. Block printing craftsmen use wooden or metal blocks to create beautiful designs.
7) Block Printing on Textiles has a very small carbon footprint. The printing and coloring process is labor intensive and uses no electricity.
8) The process uses vegetable dyes which are chemical free.
9) The material used for block printing is usually handloom or khadi, using no power

B. Weakness

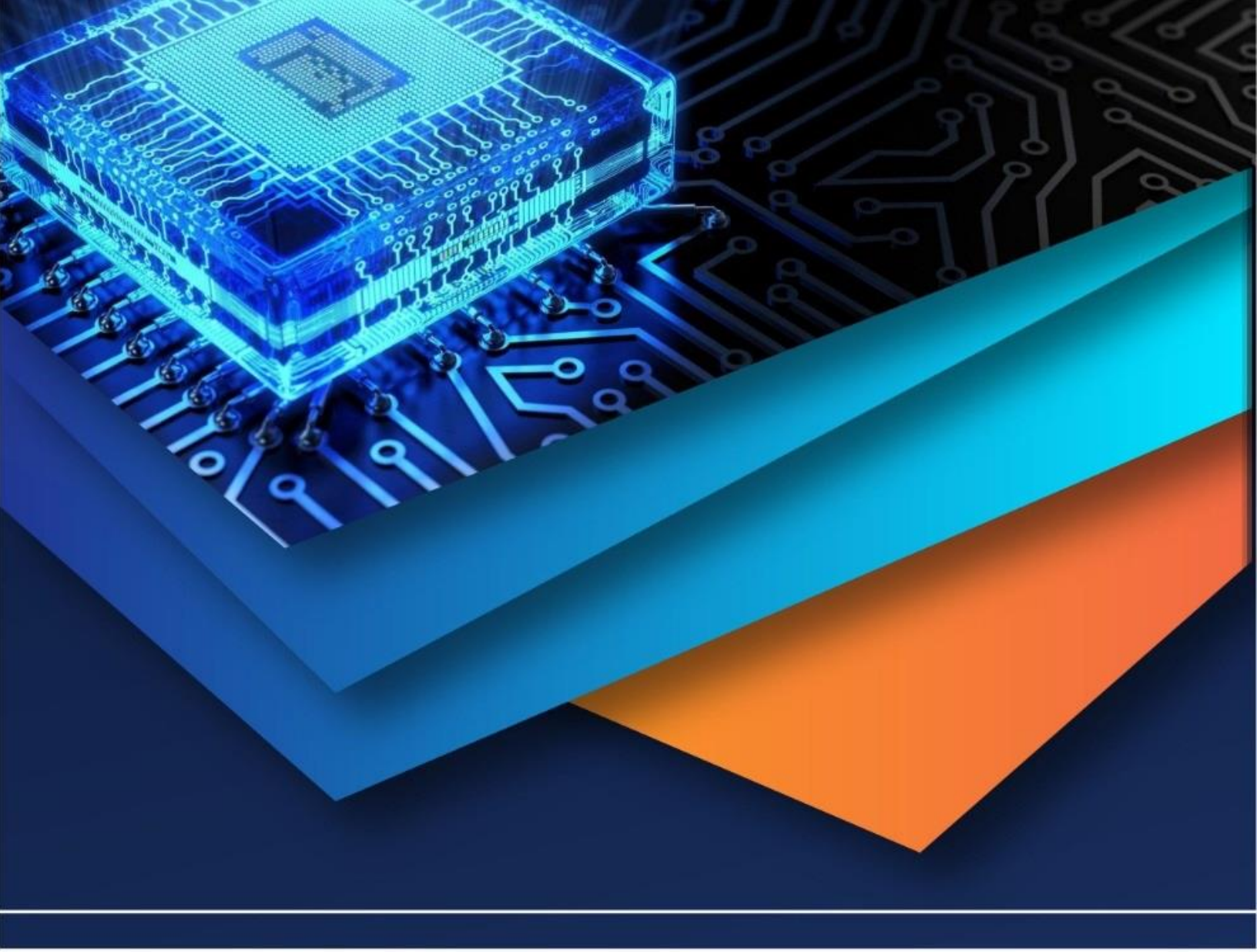
1) Time consuming process. Require human skill and labor Opportunities:
2) One of the oldest known printing technique.
3) Many Indian designers are working on block printing.
4) It is cheap and easy to start a block printing unit. India is having a very large no. of block printing units
5) In recent times the export of block printed garments have seen a steep increase as its demand has increased especially in western countries because of its durability and distinctive patterns and designs.

C. Threats

1) Block printing faces an increasing threat from the mushrooming of screen-printing units that are selling their products - often, designs copied from block prints - as genuine block printed products.
2) Modern techniques of fabric printing are cheaper and less time consuming, so they are also gaining popularity affecting the market of block printing.

REFERENCES

[1] http://www.woodprintblocks.com/
[2] http://www.craftandartisans.com/hand-block-printing
[3] http://treesouls.com/eco-living/revival-of-traditional-eco-friendly-hand-block-printinq-in-bagru-rajasthan/
[4] http://www.aiacaonline.org/pdf/block-printing-extended-documentation.pdf
[5] http://www.theindianblockcompany.com/P



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