

## Utilizing Artificial Intelligence Technical to develop some Textile Craft Industries

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#### Abstract:

Textile craft industries are a milestone of creativity that has been growing in value over the ages and has been considered one of the backbones of economics in the past. All studies confirm their important role in industrialization programs and their economic and social benefits, where they rely on local raw materials, making them more integrated into the national economy than large industries. This study deals with providing the scientific foundations for the development of textile crafts by benefiting from the development of design using artificial intelligence techniques, where artificial intelligence techniques allow the creation of new textile designs quickly, with high resolution, that are unprecedented and unexpected, which helps save time and effort for artisans. It also helps to improve the efficiency and quality of design and allows the artisan to express his creativity and excellence in meeting the client's needs. It also enhances its growth and economic sustainability by developing its skills in using smart and new technology to maintain its competitiveness and improve its products. This research offers a useful model for achieving the intended goals, as some segments of the textile craft industry have vanished while others are having difficulties. by defining the stages of production and the role of innovative design using artificial intelligence technologies in developing them. In addition to developing innovative abilities and qualifying young people to work in competitive fields that provide job opportunities and release their creativity, The rapid pace of technological advancement and globalization are challenging traditional methods in the textile craft industries. While these crafts embody rich cultural heritage and historical significance, they face a decline due to changing economic conditions, shifts in consumer preferences, and intense competition from mass-produced goods.. The application of artificial intelligence (AI) in this sector offers potential solutions but remains largely underexplored. By embracing AI, there is an opportunity to preserve these industries' cultural value while making them economically viable and competitive in the global market. The research challenge is underutilizing emerging technologies, such as artificial intelligence and automation, to advance the textile craft industries. Additionally, it addresses the need to enhance craftsmen's intellectual and creative capacities in this domain. The research aims to benefit from artificial intelligence techniques in developing textile craft industries, establish criteria for preservation and advancement, and create a strategy to revive the sector based on current needs. The significance of the research is increasing awareness and promoting belonging towards the love of crafts for the revival of textile craft industries in the hearts of the young. The study highlights the significance of textile and craft industries in reducing unemployment and promoting employment. With the preservation and innovative applications of textile craft industries in contemporary society, this research can guide graduates to self-employment and prepare modest initiatives to optimize entrepreneurial benefits. A descriptive and practical approach is used in this research. where Several designs with varied decorations and a predominantly geometric nature were created using artificial intelligence tools and are suitable for implementation in any of the textile implementation methods used in the research (kilim, carpets, and soumak). Moreover, the three methods can be used together in any design. The designs have been used in more than function, whether floor furnishings or textile hangings, as they always were, in addition to changing their use to new uses such as bags, chairs, sofas, etc., and by taking advantage of intelligence tools, simulating the employment, changing designs, and modifying them until reaching their final image using artificial intelligence tools, which shortened time and effort and achieved the goal of the research. The most important results were: By embracing AI, small heritage industries can leverage this technology to enhance their cultural heritage. In addition, AI can help these small heritage industries create more efficient and cost-effective preservation strategies. The development and revival of textile arts and crafts using artificial intelligence techniques reduces the unemployment rate, transforms some groups that need assistance into productive groups, addresses some economic problems, and stimulates tourism, Artificial intelligence techniques contribute to reviving textile arts and crafts and balanced regional development, covering urban and rural areas. They also contribute to raising the efficiency of textile craft industries, developing products, and increasing production quality.

#### Keywords:

Textile design, Craft textile industries, Artificial intelligence Techniques, sustainable development.

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#### Introduction:

In a world that is becoming more interconnected, our perception and approach to cultural heritage

have a greater impact on our sense of identity and surroundings than ever before. In recent years, there has been a tremendous expansion of new

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technologies, which have had an impact on all areas of our lives (Abisuga & Sirayi; 2018) This has influenced the way communities perceive their own and other cultures' heritage. The handicraft industry plays a crucial role in Egypt's economy, providing several employment opportunities for artisans in rural areas. (Gad Elrab: 2021) The advent of contemporary designs has rendered traditional processes obsolete, resulting in a significant decline in the sales of handicrafts in the era of globalization. (Tlostanova, 2019) To be competitive internationally, the Egyptian handicraft sector needs to integrate contemporary design and handmade techniques Technology improves efficiency and preserves the high standard of craftsmanship in traditional handmade product design. (Yassin.,(2020)) Artificial intelligence technology can potentially enhance the efficiency of producing, designing, and creating handcrafted objects. It also offers craftspeople new avenues for creativity. Artificial intelligence has the potential to assist industries that rely on skilled workers to produce customized goods. Nevertheless, the implementation of AI faces obstacles such as substantial upfront costs, the displacement of conventional expertise and employment, and ethical considerations. . (Terry 1999) Also, certain artisans have concerns that artificial intelligence (AI) may supplant them while AI has the potential to develop craft industry technologies, and can enhance the capabilities of craftspeople instead of displacing them. The integration of artisan traditions and traditional skills with AI is essential for the long-term expansion of these sectors. (Anderson and Rainie: 2018) Conducting a more extensive study of manual manufacturing may lead to more favorable outcomes compared to mechanizing it. This study provides valuable insights into the evolving nature of the textile crafts sectors and offers recommendations for their advancement by taking advantage of artificial intelligence techniques to enhance the efficiency of crafts organizations in achieving their objectives. (Xiang, Niu, & Wu, 2022)

### Research problem:

In the textile craft industries, traditional methods are being challenged by the rapid pace of technological advancement and globalization. While these crafts embody rich cultural heritage and historical significance, they face a decline due to changing economic conditions, shifts in consumer preferences, and intense competition from mass-produced goods. The application of artificial intelligence (AI) in this sector offers potential solutions but remains largely underexplored. By embracing AI, there is an opportunity to preserve these industries' cultural

value while making them economically viable and competitive in the global market.

### The problem is represented by the following questions:

- 1- What impact does the application of AI have on the adaptability of the textile craft industries to changing market conditions?
- 2- In what ways can automation improve the efficiency and sustainability of production processes in the textile craft industry without compromising the quality and uniqueness of handcrafted products?
- 3- How can AI-driven platforms be developed to facilitate skill enhancement for craftsmen, blending traditional techniques with modern technology training?
- 4- What are the implications of underutilizing emerging technologies, such as artificial intelligence and automation, in advancing the textile craft industries?
- 5- What are the potential barriers and challenges to implementing AI in the textile craft industries, and how can they be overcome?

### Research aims:

- 1- Get the Benefit of Artificial Intelligence Techniques in The Development of Textile Craft Industries
- 2- Develop a strategy to revive the Textile Craft Industries based on current needs.
- 3- To assess the role of AI in maintaining and enhancing the economic viability and global competitiveness of the textile craft industries.

### The significance of research:

- 1- Increasing awareness and promoting belonging towards the love of crafts for the revival of Textile Craft Industries in the hearts of the young.
- 2- The study highlights the significance of Textile Craft Industries in reducing unemployment and promoting employment.
- 3- The preservation and innovative applications of Textile Craft Industries in contemporary society.
- 4- This research can guide graduates to self-employment and prepare modest initiatives to optimize entrepreneurial benefits.

### Theoretical frame:

#### Artificial Intelligence (AI)

Artificial intelligence (AI) is the simulation of human intelligence in machines or computer systems, enabling them to perform tasks that require human intelligence. The duties include problem-solving, learning from experience, comprehending natural language identifying patterns, making decisions, machine learning, deep learning, natural language processing, computer vision, and expert systems. It automates processes,

analyzes massive datasets, makes predictions, and improves healthcare, finance, automotive, robotics, and more decision-making (Deng and Chen, 2021)

### **The role of Artificial Intelligence in developing design handicraft textile industries.**

The development of textile crafts design using artificial intelligence (AI) techniques and tools has revolutionized the textile and design industries. AI offers a range of tools and technologies that can enhance and innovate textile designs while leveraging the skills of artisans. Here are some key aspects of this development:

- 1- **Generating Innovative Designs:** AI technologies, such as generative adversarial networks (GANs) and other generative algorithms, can create innovative textile designs. These tools can produce original patterns and designs by analyzing large databases of previous designs, thus expanding the creative horizons for designers without extensive manual intervention. (Ismaiel and Yousef, 2022)
  - 2- **Enhancing Artisan Skills in design:** AI can complement and enhance the skills of traditional artisans by providing them with advanced design tools. These tools can suggest design modifications, optimize patterns, and simulate various design scenarios, enabling artisans to experiment and refine their craft more effectively.
  - 3- **Design Customization:** AI allows for the customization of textile designs to meet individual customer preferences. Customers can use AI-powered platforms to select colors, patterns, and fabrics they prefer, enabling them to receive bespoke textile products tailored to their tastes. "(Tlostanova, M. V. (2019))"
  - 4- **Inspiration and Trend Analysis in design:** AI can inspire designers by analyzing current trends and suggesting new design ideas. By keeping track of social media, and cultural movements. This capability can help designers identify popular trends and create designs that resonate with current market demands, ensuring their work remains relevant and appealing.
  - 5- **Enhanced Precision and Detail:** AI tools can assist artisans in achieving greater precision and detail in their designs. By using machine learning algorithms, designers can fine-tune intricate patterns and ensure that the final product meets high standards of quality and detail, which might be challenging to achieve manually.
  - 6- **Efficiency in the Design Process.:** AI can streamline the design process by automating repetitive tasks and optimizing workflows.
- This efficiency allows artisans to focus more on the creative aspects of design, reducing the time and effort required to produce high-quality textile products. .( Sikka, Sarkar, and Garg 2022)
- 7- **Virtual Prototyping:** AI enables virtual prototyping of textile designs, allowing artisans to visualize their work before committing to physical production. This technology helps in identifying potential issues early in the design process and making necessary adjustments, saving time and resources.
  - 8- **Automating Repetitive Tasks in designs:** AI can automate repetitive tasks involved in the design process, such as pattern generation, color matching, and template creation. By automating these tasks, artisans can save time and focus their efforts on more creative aspects of design. (Pal, 2017)"
  - 9- **Streamlining design Workflows:** AI-powered design tools streamline workflows by optimizing the sequence of design tasks and eliminating unnecessary steps. This efficiency ensures that artisans can complete projects in less time and with fewer resources, leading to increased productivity.
  - 10- **Faster Iterative Design:** AI enables faster iteration of designs by providing real-time feedback and suggestions. Designers can quickly explore multiple design variations and make iterative improvements, reducing the time it takes to finalize a design. ( Xiang, Niu, and Wu2 ,2022)
  - 11- **Reducing Design Errors:** AI tools can detect and correct design errors more effectively than manual methods, minimizing the need for time-consuming rework. By identifying issues early in the design process, AI helps artisans save time and produce higher-quality
  - 12- **Collaborative Design Platforms:** AI-powered collaborative platforms allow multiple artisans and designers to work together seamlessly. These platforms can facilitate the sharing of ideas, real-time feedback, and iterative improvements, fostering a collaborative environment that enhances creativity and innovation.(Sikka, Sarkar, and Garg 2022)
- The integration of AI in textile crafts design not only enhances creativity and innovation but also reduces the time and effort required in various aspects of the design process. By automating repetitive tasks, streamlining workflows, and enabling faster iteration, By providing innovative design solutions, improving precision, and facilitating collaboration, AI empowers designers to push the boundaries of their craft and produce

unique, high-quality textile products. This synergy between traditional craftsmanship and advanced technology promises a future where textile design is both innovative and deeply rooted in artisanal skills. (Deng and Chen, 2021)

In this research was done in creating designs and simulating their use using artificial intelligence tools and programs such as (Midjourney, Chat GPT 4 and Dall3).

#### **Artisanal sectors:**

The integration of AI in textile crafts design not only enhances creativity and innovation but also reduces the time and effort required in various aspects of the design process. By automating repetitive tasks, streamlining workflows, and enabling faster iteration, by providing innovative design solutions, improving precision, and facilitating collaboration, (Sikka, Sarkar, and Garg 2022) AI empowers designers to push the boundaries of their craft and produce unique, high-quality textile products. This synergy between traditional craftsmanship and advanced technology promises a future where textile design is both innovative and deeply rooted in artisanal skills. (Deng and Chen, 2021)

#### **Textile craft industries:**

Textile craft industries cover a diverse array of textile production methods that utilize traditional techniques. These industries include a range of textile production methods, including weaving, knitting, embroidery, dyeing, and other related crafts. (Abisuga & Sirayi, 2018) is provided. The textile craft industries employ a combination of industrial technology and expert workmanship to produce a wide variety of items utilizing both natural and synthetic materials. The market demand for eco-friendly handcrafted textile items is experiencing swift growth. (Pal,2017). Textile craft items possess a global appeal due to their cultural history and handcrafted characteristics. By offering assistance to the artists who are responsible for producing these products, we contribute to the conservation of textile craft traditions. (Karaman, 2015).

#### **Textile craft industries used in this study:**

Kilim, carpets, and soumak crafts were selected in this research because shed light on the traditional crafts that are essential to their diverse uses, aesthetic appeal, and durability. They are crucial cultural heritage elements and contribute significantly to various aspects of life.

#### **The kilim (tapestry) industry craft:**

- Kilim is a flatwoven textile made by interweaving the warp and weft threads to create a flat, non-pile surface. Kilims are known for their intricate patterns, vibrant colors, and cultural significance. Kilims come

in different varieties, each possessing distinct features and origins. (Choubisa , Sinha, & Chattopadhyay ,2020)

- Kilim weaving is a weaving method that involves marking apart separate areas of color and surface treatment from one other in the woven plane. More specifically, the phrase refers to a weaving technique, or a variation of it, in which a weft thread entirely covers the warp and only goes over the surface of the specific areas of the weaving that are intended to be constructed with it. (Han., 2011) The thread forms interlocking connections at the borderlines, either with adjacent weft threads or with a warp thread, before returning to its field at a change of shed.
- kilim field is pictorial, as opposed to pattern weaving, which involves repeating motifs. The system operates by utilizing forms that possess significance both independently and about the overall visual arrangement. (Kirk, 1999) The use of variform elements in a design requires a structural scheme that allows for maximum freedom and flexibility. These elements need to be placed freely within the design, without being limited by the mechanization of the weaving process. (More et al., 1992)
- The procedure usually commences with the fabrication of a design or pattern that the weaver desires to replicate in the kilim. Typically, this design is premeditated or outlined beforehand, functioning as a model for the process of weaving. The warp threads are arranged on the loom, tautly and uniformly, to establish a seamless and sturdy base for the kilim. The weaver uses the weft threads, which are frequently dyed in diverse hues, to construct the design. The weft threads traverse the warp threads by passing over and under them, in accordance with the designated pattern. The process involves utilizing a portable device known as a "batten" or a "shuttle" to propel the weft through the fabric. (Kirk, 1999)
- Kilim has conveyed mythical, religious, landscape, and abstract narratives throughout its historical trajectory. Currently, its sole purpose is limited to being utilized as floor coverings or wall hangings. Tapestries vary in size, ranging from small wall hangings to large-scale public art installations. The kilim craft industry is vibrant and varied in the textile and decorative arts sectors due to its integration of traditional weaving techniques with modern technology and innovative designs. (Han, 2011)



- Woven kilim offers a diverse array of artistic possibilities, encompassing both traditional and historical motifs as well as contemporary and abstract designs. Kilim weaving possesses a profound historical significance in diverse cultures and endures as an object of admiration for its aesthetic appeal and skilled artistry. The craft is characterized by its time-consuming and labor-intensive nature, demanding a high level of expertise, patience, and originality (Cassin, 1998).

#### **Crafts carpet industries:**

Carpets, an old handcraft, have been linked to humans and the environment. They are a unique art form in certain countries. Handmade carpet production began during the Pharaohs' time but expanded throughout the Mamluk era due to their focus on maintaining folk history. (Darbanhosseiniamirkhiz, Shabanifar ., and Ismail, 2011) Carpets are prized for their cultural significance, aesthetic expression, and practicality. Whether made in old or modern ways. The carpet craft sector combines aesthetic imagination and expert craftsmanship. Carpets contribute warmth and beauty to interior spaces, as well as being utilitarian and ornamental art pieces. (Sanchini, 2018)

Even though technological advancement and development have taken place over many years, handmade carpet manufacturing practices today are largely the same as they used to be hundreds of years ago. The art and craft of weaving a carpet have been passed on for many generations, consisting of several different steps that are all part of a genuine handicraft. For hundreds of years, it was rare for people, except the very wealthy living outside the Orient, to possess a carpet. (Jørgensen, Eicher and Wendrich , 2023)

- Carpets are woven from various yarns, such as wool, silk, cotton, synthetic fibers, and mixes. The yarn selection affects the carpet's texture, look, and durability. Various colors and tones in carpets are achieved using natural and synthetic dyes.
- Carpet uses several looms, including vertical, horizontal, and hand-tufted, which include forcing yarn through a backing material and fastening it with adhesive or other techniques. (Gupta, Majumdar & Goswami , 2017) . The handmade carpet production sector has dwindled in recent decades, with few craftspeople remaining.
- Handmade carpet techniques. Various techniques are used to craft these beautiful textiles, and the specific method can vary depending on the region, tradition, and materials available. (Sanchini, 2018 )

#### **Here are some common handmade carpet techniques:**

**Hand-Knotting:** This is the most well-known and widely used technique for creating handmade carpets. It involves tying individual knots of yarn onto the warp threads of the loom. The density of knots per square inch and the type of knot used the Turkish (or Ghiordes) knot and the Persian (or Senneh) knot can greatly affect the texture and pattern of the carpet. (Gupta, Majumdar & Goswami, 2017) The more knots per square inch, the finer and more intricate the design.

**Knotted carpets are very durable.** This technique involves using a hook to pull loops of yarn or fabric strips through a mesh or burlap foundation. A backing material then secures the loops. Hand-hooked rugs often have a textured, plush appearance and are popular in folk art and country-style decor. (Jørgensen, Eicher and Wendrich , 2023)

**Hand-Tufting:** In this technique, a tufting gun is used to punch through a backing fabric using a tufting gun or tool to create a cut or loop pile on the front side of the carpet. The back is then coated to secure the tufts .The loops are then cut to form the desired pile height. Hand-tufting is faster than hand-knotting and is often used for creating less expensive rugs. (Hashem, Ashmawy, and Allam,2022)

**Needlepoint:** Similar to hand-hooking, needlepoint involves stitching yarn or thread onto a canvas or other fabric. This technique is often used for smaller, more decorative pieces like chair cushions and wall hangings.

**Latch Hooking:** Latch hooking is a variation of the hand-hooking technique where yarn is knotted through a grid-like fabric using a latch hook tool. It's commonly used for making shaggy or fluffy rugs. (Guo, Narayanan, and McCann, 2020).

**Braided rugs-** Strips of fabric are braided together and then sewn into spirals or ovals to form the rug. Other techniques include felting, embroidering, knitting, crocheting, etc. Natural fibers like wool, cotton, and silk are commonly used. Dyes can be natural or synthetic. (Darbanhosseiniamirkhiz, Shabanifar., and Ismail, 2011)

The quality of a handmade rug depends on the materials used and the skill of the artisans in employing the technique. Proper finishing is also important for durability. (Gupta, Agarwal, and Kumar, 2018)

The choice of technique, materials, and design can greatly influence a handmade carpet's final appearance and value. The skills and traditions passed down through generations contribute to the uniqueness and cultural significance of each piece. (Choubisa, Sinha, & Chattopadhyay,2020)

### The Soumak:

The exact origins of Soumak weaving are challenging to pinpoint, but it is believed to have ancient roots. The technique likely developed independently in different regions where weaving was practiced. Some of the earliest examples of Soumak textiles have been found in archaeological excavations in the Caucasus region, Persia (modern-day Iran), and Anatolia (modern-day Turkey), dating back to as early as the 4th or 5th century. (Al-Shafi'i, Al-Asfour, Al-Sayyid, 2020) Soumak is a type of flatweave technique, but it involves wrapping supplementary weft threads around the warp threads to create a raised textured pattern. The Soumak technique, like that used to make a kelim, produces a patterned weaving with a flat surface of discontinuous horizontal threads known as weft. It is a wrapping of weft yarns over warp threads—either singly or in groups in any of several patterns. This primary structural component. (Karaman, 2015). They are passed over and under adjacent warps. There are no slits at each color join, Second wefts create the woven soumak, these wefts are invisible from both the front and back of a soumak weaving and can only be seen by bending the weaving in a horizontal direction. However, some later groups of soumak lack structural wefts and the added strength they provide. When rows of soumak are alternated with plain weave, a ribbed effect is produced, It is like a stem stitch or overcast stitch in embroidery, as it also can be used for outline shapes. (Ishaq 2017)

- There are also several different soumak techniques - plain and countered as well as reverse. These styles can also differ somewhat depending on the many possible. (More et al., 1992) Soumak is considered one of the techniques that resembles an embroidery stitch in its final form, as it gives various decorative and textural effects with each type. We find that while weaving it, we make a border of plain fabric between its rows, which serves as a ground for the soumak, but this border does not appear because of the surface appearance, but merely because of Preserving the texture of the woven from stretching. (Gupta, Majumdar & Goswami, 2017)
- The soumak weft can be the only, or major weft, or it can be a supplementary or pattern weft with tabby between rows. For a durable, firm rug several rows of plain weave between the soumak rows is most practical—the tabby packs down in under the soumak rows and tends to raise them from the ground weave. (Jørgensen, Eicher and Wendrich, 2023) The filler rows can be the same yarn, finer, or even

a different color. Soumak allows leeway in color, flat, or raised patterns. (Karaman, 2015). Soumak weaving has demonstrated its adaptability and ability to incorporate different cultural influences and design aesthetics. Today, Soumak rugs and textiles remain highly regarded for their beauty, craftsmanship, and historical significance, and they continue to be valued as both functional and decorative art pieces. (Jørgensen, Eicher, and Wendrich, 2023) Many traditional Soumak weaving techniques have been recognized as Intangible Cultural Heritage by UNESCO, highlighting their cultural significance and the importance of preserving these traditional crafts.

### Here are some of the notable types of Soumak weaving:

**Flat Soumak:** The soumak weaving technique involves the wrapping of supplemental weft threads around the warp threads in a flat and even way, resulting in a smooth and uniform surface. This particular variety of Soumak is frequently employed in the creation of uncomplicated, geometric designs. (Cassin, 1998).

**Beveled Soumak** is distinguished by the diagonal or beveled look of the additional weft wraps. The weaver encircles the additional weft threads around the warp threads at an inclined angle, resulting in a diagonal, tactile outcome. This technique is frequently employed to enhance the design by introducing depth and dimension.

**Interlocking Soumak:** Interlocking Soumak involves weaving the additional weft threads in a manner that causes them to interlock, resulting in a design that is both intricate and tightly woven. This method is frequently employed to generate elaborate and meticulously crafted patterns. (Holt, 2009)

**Banded Soumak** is a weaving technique that involves using supplemental weft threads of various colors or color bands. This results in the formation of discrete bands or stripes of color inside the design. This technique is frequently employed in Soumak carpets to enhance visual appeal and introduce diversity to the patterns.

**Single Soumak:** The soumak stitch is executed by moving the thread forward under two warps, then back over one, and so on. This creates an appearance similar to beads threaded onto the warp. (Marouf, 2005)

**Three-Dimensional Soumak:** Some weavers enhance the Soumak technique by including three-dimensional or sculptural elements in their textiles. This process entails manipulating the additional weft threads in order to produce elevated, textured, or even sculpted components within the design. (Jørgensen, Eicher and Wendrich, 2023)

6. **Combination Soumak:** Weavers frequently integrate Soumak with other weaving techniques,

such as plain weaving or knotted pile weaving (as observed in Persian carpets), to produce hybrid designs that embrace the most advantageous characteristics of each technique. (Ishaq 2017)

### Research Methodology:

The methodology of the research consists of two parts, as follows:

The first part deals with a literature review of textile Craft Industries and the utilizing Artificial Intelligence in their development. The second part deals with simulation work which is creating designs by using, computer programs (Photoshop and Illustrator), and Artificial intelligence programs. {Midjourney ,Bing and Chat GPT4 (Humanize Ai, Image Generator, Dall-E, Consensus) Where created 23 designs inspired by various motifs and arts, mostly geometric in nature using artificial intelligence tools which reduced time and effort besides showed the textural effect, simulating the final product, which allowed experimentation to reach the desired design idea without time or effort It is worth noting that all designs are suitable for implementation in any of the chosen styles (kilims, carpets, and soumak), as well as suitable for combining these All or some of the methods in one design to combine the advantages of more than one method and to overcoming the difficulties that obstruction none of the three methods

### Innovative tapestry designs:

In the past, kilims, rugs, and soumak weavings were primarily used as floor coverings and wall hangings. With advancements in technology, particularly artificial intelligence, the use of kilim, rug, and soumak weavings has evolved significantly, no longer confined to floor coverings and wall hangings. where AI allows for detailed simulations and visualizations of products before they are made, enabling designers to explore a wider range of uses and functionalities. With the



Fig. (1) illustrates the innovation design and its use as a hanging wall in airports

aid of artificial intelligence, these traditional textiles are being creatively incorporated into furniture, home accessories, fashion items, and more. This fusion of old-world craftsmanship with modern technology not only preserves cultural heritage but also broadens the scope of design possibilities, making these textiles relevant and desirable in today's diverse market.

### The first design:

The design shown is a sophisticated and modern interpretation of traditional Egyptian elements, blended into a geometric and abstract art style. This design utilizes a rich of earth tones, creams, and soft grays, organized in a patchwork of varying textures and patterns, each reflecting different aspects of Egyptian culture. The imagery includes iconic pyramids, lush palm trees, rural landscapes, and abstract representations of water and sand, conveying a sense of Egypt's rich historical and geographical landscape. The composition of this design is carefully segmented into triangles and parallelograms, which not only guide the eye across the entire piece but also provide a dynamic and contemporary look. This geometric structuring allows for each segment to tell a part of Egypt's story, from ancient times to the present, encapsulating themes of heritage, nature, and architecture.

Employed as a hanging tapestry in airports, this design serves multiple purposes. Aesthetically, it enriches the space with cultural artistry, transforming a transient environment into a gallery of national heritage. Practically, it provides travelers with a welcoming impression of Egypt, encapsulating the beauty and essence of the country in a single glance. Its placement in airports can also serve as an educational piece, inviting viewers to explore the stories and symbols represented within each segment, thus deepening their appreciation for Egypt before they even step outside.





**The second design:**

The design is a vibrant and intricate abstract geometric pattern. It features a dynamic interplay of lines, shapes, and colors that create a sense of depth and movement. The design is composed of various geometric shapes, including circles, lines, and angular forms. These shapes are arranged in a seemingly chaotic yet harmonious pattern, creating a visual journey for the viewer's eye. The pattern includes overlapping elements and intersecting lines, which add complexity and depth to the design. The color is rich and diverse, featuring bold

primary colors such as red, blue, and yellow, alongside secondary and tertiary colors. The use of contrasting colors enhances the vibrancy and draws attention to different parts of the design. There are also gradients and shading techniques applied to some shapes, adding a three-dimensional effect. The design has a high visual impact due to its bold colors and intricate patterns. The wall hanging functions as a central decorative element that enhances the room's aesthetic appeal, and contributes to a cohesive and harmonious decor.



Fig. (2) illustrates the innovation design and its use as floor furnishings in a living room

**The third design:**

The design is a complex and abstract geometric pattern. It features a central motif with interlocking shapes, triangles, and parallelograms, creating a sense of depth and structure. The pattern extends outward with lines and shapes that give the impression of movement and expansion. The color palette includes muted and earthy tones such as grays, browns, and greens, with occasional highlights of rust and orange. These colors create a sophisticated and subdued aesthetic that complements modern interior design. The design is visually striking due to its intricate patterns and the

interplay of light and shadow. The central motif acts as a focal point, drawing the eye and creating a sense of balance and symmetry. The rug enhances the aesthetic appeal of the room by adding a sophisticated and visually engaging element to the floor. Placing the rug in the living area helps define the space, creating a distinct zone for seating and socializing. The rug functions as a piece of artistic and cultural expression, showcasing modern design elements in a functional form. It adds a layer of cultural richness and artistic value to the home, reflecting the occupant's appreciation for contemporary art and design.



Fig. (3) illustrates the innovation design and its use as floor furnishings in a living room

**The fourth design:**

The design is visually engaging due to its detailed patterns and balanced color scheme. The symmetry and repetition of geometric shapes provide a sense of order and stability, making the design aesthetically pleasing and calming. The geometric patterns refer to traditional weaving and textile designs, suggesting a connection to cultural heritage and craftsmanship. This reflects an appreciation for traditional art forms and the

preservation of cultural identity. The earthy color palette and the solid geometric shapes convey a sense of stability and grounding. The rug enhances the aesthetic appeal of the space by adding a visually stimulating and decorative element to the floor. It serves as a focal point that ties together the decor of the room, especially complementing furniture with neutral tones. The geometric design of the rug serves multiple purposes, from enhancing the aesthetic appeal and comfort of the space to



defining areas and adding cultural and artistic value. It represents balance, harmony, stability, and

a connection to tradition through its intricate patterns and earthy colors.



Fig. (4) illustrates the innovation design and its use as floor furnishings in a living room

#### The fifth design:

The wall hanging features a sophisticated color palette that includes shades of black, white, grey, and red. This combination of neutral tones with a bold accent color creates a striking visual contrast. The design consists of a mix of geometric shapes and abstract forms. The patterns include circular motifs, linear elements, and curved lines, all arranged in a dynamic and visually engaging composition. The interplay of the different shapes and lines gives the piece a sense of movement and depth. The wall hanging blends elements of modern abstract art with geometric design. The abstract nature of the piece allows for personal interpretation, making it a conversation starter and

a focal point in any room. As a wall hanging, this piece serves primarily as a decorative element. Its bold design and vibrant colors can enhance the aesthetic appeal of the space, adding a touch of modern sophistication. The artwork's dynamic composition can help break the monotony of plain walls, making it ideal for spaces such as dining rooms, living areas, or offices. The meticulous craftsmanship is evident in the precise execution of the intricate patterns. The use of bold colors against neutral tones creates a striking visual impact. The composition is thoughtfully designed to guide the viewer's eye across the artwork, ensuring that no single element dominates the piece.



Fig. (5) illustrates the innovation design and its use hang wall in a tourist restaurant

#### The sixth design:

The design showcases a mix of geometric shapes and abstract patterns. These include diamonds, triangles, and linear motifs arranged in a symmetrical and rhythmic composition. The patterns are densely packed, providing a sense of intricacy and detailed craftsmanship. The rug features a vibrant color palette, including shades of red, orange, teal, and various earth tones. This combination creates a lively and warm atmosphere. The texture of the rug is emphasized through varying weaving techniques, creating a tactile and visually appealing surface. The use of different yarn thicknesses adds depth and dimension to the

patterns. The rug blends traditional textile motifs with modern design elements. The geometric patterns are reminiscent of traditional weaving techniques, while the vibrant color palette and abstract composition give it a contemporary feel. The vibrant colors and intricate patterns make the rug a focal point in any room, adding a touch of elegance and sophistication. The design philosophy focuses on harmony and balance, combining structured geometric forms with a rich and dynamic color palette. This approach creates a visually engaging and aesthetically pleasing piece. The composition is thoughtfully arranged to ensure a

balanced distribution of colors and patterns, guiding



the viewer's eye across the entire design.



Fig. (6) illustrates the innovation design and its use as a hanging wall in a living room

### The seventh design:

The tapestry design is a visually striking piece, characterized by its bold geometric patterns and vibrant colors. The design consists of an array of shapes and motifs arranged in a balanced composition, evoking a sense of harmony and rhythm. Diamond and zigzag shapes are prominently featured, creating a dynamic visual flow. The design incorporates elements reminiscent of traditional Middle Eastern or North African art, such as palm trees and tents. The tapestry uses a warm, earthy palette with shades of brown, beige, black, and touches of blue, giving it a rich and

inviting appearance. The tapestry draws inspiration from traditional art forms, blending them with a modern aesthetic. The geometric patterns symbolize order and structure, while the cultural motifs add a touch of heritage and identity. This fusion creates a tapestry that is not only decorative but also meaningful, reflecting a blend of contemporary design and cultural appreciation. The palm trees and tents may symbolize life in the desert, representing themes of nomadism and simplicity. The clean lines and geometric precision lend a contemporary feel, making it suitable for modern interiors.



Fig. (7) illustrates the innovation design and its use as a hanging wall in a living room

### The eighth design:

The design is a detailed and intricate geometric pattern featuring a series of interconnected shapes. These shapes are meticulously arranged to create a symmetrical and harmonious layout that draws the eye towards the center. The use of these colors adds warmth and a sense of comfort to the design, making it suitable for a home setting. The intricate patterns and the balanced color scheme create a visually engaging piece that is both complex and aesthetically pleasing. The symmetry and repetition in the design provide a sense of order and structure, which can be soothing and grounding. The geometric pattern is reminiscent of traditional motifs found in various indigenous and folk art forms. The interconnected shapes and lines might symbolize the interconnectedness of different

aspects of life and the unity that emerges from diversity. It suggests that individual elements, when combined thoughtfully, create a cohesive and beautiful whole. The rug enhances the aesthetic appeal of the room by adding a rich, visually captivating element to the floor. The rug adds a layer of comfort underfoot, making the room feel cozier and more inviting. The warm colors contribute to a sense of warmth and homeliness, enhancing the comfort of the space. The rug functions as a piece of cultural and artistic expression, showcasing traditional design elements in a contemporary setting. The geometric design of the rug serves multiple purposes, from enhancing the aesthetic appeal and comfort of the room to defining space and adding cultural and artistic value.





Fig. (8) illustrates the innovation design and its use of floor furnishings in a living room

#### The ninth design:

The design features flowing, undulating lines that create a dynamic and organic pattern. It includes a mix of geometric shapes and intricate details interwoven with the curvilinear forms. The color consists of earthy tones such as browns, beiges, and reds, complemented by muted greens and blues. The combination of these colors creates a warm and inviting atmosphere. The design is visually striking due to its fluid, wave-like patterns and intricate details. The movement created by the flowing lines adds a sense of energy and dynamism to the design.

The flowing lines and organic shapes symbolize natural movement and the fluidity of life. It represents the idea that life is not rigid but is constantly evolving and changing. Despite the complexity, the design maintains a sense of harmony and balance. It suggests that within the apparent chaos and movement of life, there is an underlying order and balance. The design serves multiple purposes, from enhancing the aesthetic appeal and comfort of the space to defining areas and adding cultural and artistic value.



Fig. (9) illustrates the innovation design and its use of floor furnishings in a living room

#### The tenth design:

The woven wall hanging depicted in the images presents an intricate and dynamic design, featuring a combination of abstract and geometric patterns. The wall hanging uses a neutral color palette, including shades of beige, brown, and black. This color scheme creates a warm and inviting atmosphere, making it versatile for various interior settings. The design showcases a blend of fluid, wavy lines, and structured geometric shapes. The wavy lines give a sense of movement and organic flow, while the geometric patterns add a structured and rhythmic element to the composition. The

texture of the weave is emphasized through the use of varying thicknesses and directions of the yarn, creating a tactile and visually engaging surface. The wall hanging includes motifs such as spirals, circular shapes, and intricate linework, which add depth and complexity to the piece. There is a balance between positive and negative space, allowing the design to breathe and preventing it from appearing too cluttered. The design elements suggest a fusion of various cultural influences, drawing inspiration from traditional weaving techniques and modern artistic trends. This blend of styles makes the piece versatile.



Fig. (10) illustrates the innovation design and its use hang wall in a living room



**The eleventh design:**

The wall hanging utilizes a vibrant and bold color palette, including shades of red, blue, yellow, green, and beige. These colors create a lively and energetic atmosphere. The design features abstract, swirling patterns combined with figurative elements. The swirling patterns are reminiscent of clouds or waves, adding a dynamic sense of movement. The central imagery includes three stylized human figures carrying colorful baskets, which adds a narrative and cultural element to the piece. The use of circular and curved shapes throughout the design contributes to the overall fluidity and rhythm. The figures are depicted in a

simplified, almost silhouette-like manner, which contrasts with the detailed and intricate background patterns. The woven wall hanging blends abstract art with figurative elements, creating a piece that is both visually engaging and narratively rich. The abstract background and the figurative foreground work together to create a cohesive and harmonious design. The wall hanging serves as a focal point in the room, drawing attention with its vibrant colors and intricate design. It enhances the aesthetic appeal of the space and adds a sense of warmth and liveliness.



Fig. (11) illustrates the innovation design and its use hang wall in a living room

**The twelfth design:**

The design incorporates a variety of geometric shapes and abstract patterns. These include circles, triangles, squares, and lines arranged in a visually pleasing, balanced composition. The inclusion of botanical elements like leaves and stylized flowers adds a touch of nature and organic forms to the otherwise geometric design. The rug features a harmonious color palette of muted tones including beige, navy blue, soft peach, and light grey. This palette creates a calming and balanced atmosphere. The rug's design is a blend of modern abstract art and traditional textile patterns. This combination makes it suitable for contemporary interiors while also appealing to those who appreciate classic motifs. As a floor rug, this piece serves both a practical and aesthetic function. It provides a

comfortable and warm surface for the floor while also acting as a decorative element that ties the room together. The muted color scheme ensures that the rug can complement a wide range of interior decor styles without overpowering other design elements in the room. The design philosophy seems to center around balance and harmony, combining structured geometric forms with organic elements. This duality represents a blend of order and natural beauty, creating a serene and aesthetically pleasing piece. The composition is thoughtfully arranged to guide the viewer's eye across the rug, ensuring that no single element dominates the design. This balance is key to the rug's visual appeal and functionality as a unifying decor element.

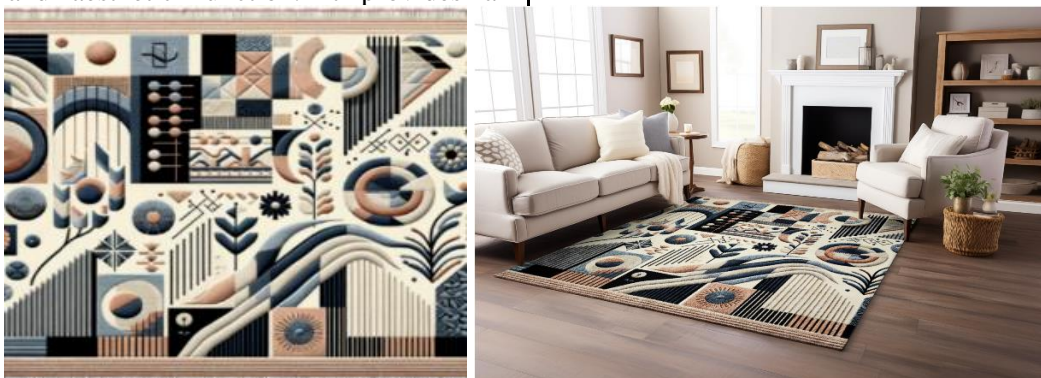


Fig. (12) illustrates the innovation design and its use of floor furnishings in a living room

**The thirteen design:**

The woven design depicted in the image showcases a captivating and intricate design,

combining geometrical shapes and abstract elements to create a visually stimulating composition. The design philosophy appears to

draw inspiration from modernist art movements, with a focus on bold, contrasting colors and dynamic forms. The central eye motif, along with the surrounding patterns, adds a sense of depth and intrigue, inviting the viewer to explore the intricate details and symbolism. The composition is meticulously structured, with a balanced distribution of shapes and lines that guide the viewer's gaze across the piece. The use of vibrant colors such as teal, burgundy, and gold against a neutral background enhances the overall impact, making it a striking focal point in any space. This woven piece not only serves as a functional floor

covering but also as an artistic statement, reflecting a blend of traditional craftsmanship and contemporary design sensibilities. As a wall hanging, this piece serves as a focal point in any room, drawing attention with its bold colors and intricate patterns. The symbolic nature of the design makes it suitable for spaces intended for contemplation or introspection, such as a study or meditation room. The design philosophy appears to focus on themes of vision, awareness, and protection, symbolized by the prominent eyes and hands.



Fig. (13) illustrates the innovation design and its use hang wall in a living room

#### The fourteen design:

The design features a vibrant and intricate tapestry inspired by traditional patterns and motifs. The composition is a blend of geometric shapes, abstract forms, and cultural symbols, arranged in a visually dynamic and balanced manner. The use of earthy tones with bright accents reflects a harmonious connection between nature and art. The central elements include sun motifs, mountains, and a stylized tree, symbolizing life and energy. The design represents a fusion of tradition and modernity, connecting past cultural heritage with contemporary aesthetic sensibilities. The geometric

patterns signify stability and order, while the vibrant colors and dynamic composition evoke movement and vitality. The design is employed as an upholstery fabric for a comfortable lounge chair, enhancing its visual appeal and adding a touch of cultural richness. The chair's ergonomic structure, combined with the lively tapestry, creates an inviting and relaxing seating experience, making it perfect for both indoor and outdoor settings. The design not only serves an aesthetic function but also brings a sense of cultural depth and artistic value to everyday furniture.



Fig. (14) illustrates the innovation design and its use hang wall in a living room and chair

#### The fifteen design:

The tapestry features a detailed and intricate design that merges geometric patterns with cultural motifs, creating a visually engaging piece. The design is rich in triangles, circles, and lines, forming a structured and dynamic composition. Elements like palm trees, agricultural scenes, and traditional structures reflect cultural heritage and add depth to the design. Warm, earthy tones of brown, beige, and black dominate the tapestry, creating a harmonious and inviting feel. This tapestry embodies the fusion of traditional motifs with

modern geometric designs, symbolizing the connection between heritage and contemporary aesthetics. The geometric shapes represent order and modernity, while the cultural motifs evoke a sense of tradition and history. The design is used as a wall hanging in tourist restaurants, where the tapestry serves as a captivating focal point, drawing the eye and enhancing the overall aesthetic of the dining area. The tapestry is prominently displayed on a brick wall, where its warm tones and intricate patterns stand out. The rustic charm of the brick complements the tapestry, creating a cozy and



welcoming environment for diners. In a contemporary setting with modern furniture and

elegant lighting.



Fig. (15) illustrates the innovation design and its use hang wall in tourist restaurant

#### The sixteen design:

The design features an abstract geometric composition with a harmonious blend of circles, lines, and shapes. The color includes warm earth tones like ochre and rust, balanced with cool shades of gray and blue, creating a visually striking yet balanced effect. The intersecting lines and overlapping shapes create a sense of depth and movement, leading the eye through the intricate pattern. Geometric shapes: Circles, lines, and rectangles dominate the design. The design reflects a modernist approach, emphasizing form and color over representational content. It draws inspiration

from abstract art movements, focusing on the aesthetic experience and the interplay of shapes and colors. Despite the complexity, the design maintains a sense of harmony through color coordination and the distribution of shapes. The intersecting lines and varying shapes guide the viewer's eye across the design, creating a dynamic feel. Incorporating this design into a comfortable lounge chair adds a contemporary and artistic touch to the furniture. The abstract pattern enhances the visual appeal of the chair, making it a focal point in any setting.



Fig. (16) illustrates the innovation design and its use in chairs for club

#### The seventeen design:

The design features an intricate arrangement of geometric shapes, including circles, lines, and rectangles, creating a modern and abstract aesthetic. The color palette includes warm earth tones like beige, brown, and ochre, complemented by cooler shades like gray and black, resulting in a visually balanced composition. The design reflects modernism, emphasizing abstraction and simplicity. It represents a blend of functionality and aesthetic appeal, embodying a minimalist approach while maintaining visual interest through the interplay of shapes and colors. The design's complexity and balance keep the viewer engaged.

The intersecting lines and varied shapes guide the viewer's eye through the design, creating a dynamic yet cohesive look. When applied to handbags, the design elevates the accessory into a stylish and sophisticated piece. The geometric patterns add a modern touch, making the bag a statement item that complements a variety of outfits. The balance of colors ensures it is versatile and appealing. The abstract patterns provide a contemporary look, when applied to seating, the design transforms chairs into artistic pieces. The geometric and abstract patterns add a modern flair to the furniture, making it a focal point in any room.



Fig. (17) illustrates the innovation design and its use in chairs and hand bag for women



### The eighteen design:

The design is a vibrant tapestry featuring flowing, organic patterns interwoven with geometric shapes. The tapestry employs a rich and lively color including hues of turquoise, orange, pink, and yellow. The composition is balanced yet dynamic, with elements such as floral motifs, swirling lines, and intricate details. Flowing lines and curves create a sense of movement. The design represents a fusion of nature and structure, symbolizing harmony between the organic and the geometric. The vibrant colors and flowing patterns evoke a sense of joy and liveliness, while the geometric elements provide a sense of order and stability. The design is eye-catching and lively, with a strong visual impact due to its vibrant colors and dynamic composition. Despite the complexity, the design maintains harmony through the balance of colors



Fig. (18) illustrates the innovation design and its use in floor furnishings in a living room

### The nineteen design:

The design is an intricate geometric pattern featuring a combination of shapes such as diamonds, triangles, and lines. These elements are arranged in a symmetrical and structured layout, creating a cohesive and visually appealing design. The color palette includes vibrant hues such as red, teal, orange, yellow, and black, set against a neutral background. The bold and contrasting colors enhance the visual impact and add a lively, dynamic feel to the design. The design is eye-catching due to its bright colors and detailed patterns. The symmetry and repetition of geometric shapes provide a sense of order and balance, making the design both aesthetically pleasing and engaging. The geometric patterns are reminiscent of

and the interplay between organic and geometric elements. The swirling lines and curves create a sense of movement, guiding the viewer's eye through the design. When applied to a comfortable sofa, the design transforms the piece of furniture into a vibrant focal point. The tapestry's lively patterns and colors enhance the visual appeal of the sofa, making it not just a functional item but also a piece of art. When design applied to the suitcase features a vibrant design with bright colors incorporating intricate and curved geometric patterns, giving the suitcase a unique and eye-catching appearance. The multi-colored motifs add an artistic and lively touch, making it stand out easily and adding a personal and stylish flair for travelers. The design showcases a balanced distribution of colors and patterns, reflecting beauty and precision in execution.

traditional textile designs found in various indigenous cultures. This can symbolize a connection to heritage and the preservation of traditional art forms in a contemporary context. The use of bright, vibrant colors represents energy, life, and vitality. The structured layout and symmetry of the design represent order and balance. It reflects the idea that beauty can be found in well-organized and harmonious arrangements. The rug enhances the aesthetic appeal of the space by adding a vibrant and visually stimulating element to the floor. It creates a distinct zone, enhancing the organization and functionality of the room. The rug functions as a piece of cultural and artistic expression, showcasing traditional design elements in a functional form.

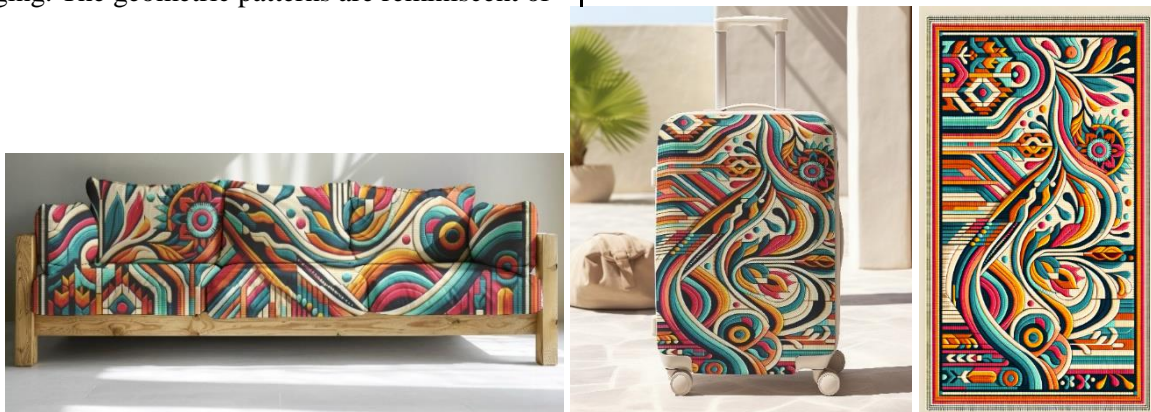


Fig. (19) illustrates the innovation design and its use in suitcase and sofa The twenty design

The tapestry design showcases a complex interplay of geometric patterns and abstract motifs, creating a visually engaging and texturally rich piece. The tapestry design embodies a balance between natural elements and geometric precision, symbolizing the harmony between nature and human creation. The flowing lines and abstract shapes represent landscapes and natural forms, while the geometric patterns symbolize structure and order. Despite its abstract nature, the design maintains a contemporary feel through its structured patterns and cohesive color palette, making it suitable for modern interiors. The design adds texture and depth to the restaurant's interior, enhancing the overall dining experience by providing a visually

stimulating environment. Displayed prominently on a large wall, the tapestry transforms the restaurant space, adding cultural richness and visual interest. It can be placed behind the main dining area or in a private dining section to create a distinctive ambiance. Usage as a Pouf Chair, The design, when applied to a pouf chair, transforms it into a functional and artistic piece of furniture. The intricate patterns and harmonious color scheme make the pouf chair a standout piece, adding a touch of elegance and sophistication to any room. In a living room or lounge area, the pouf chair can serve as a decorative yet functional element. It provides additional seating while also contributing to the overall aesthetic of the space.



Fig. (20) illustrates the innovation design and its use in hang wall and chair

#### The twenty-one design:

The tapestry design is an intricate piece that features a blend of geometric patterns and vibrant colors. The design is dominated by various geometric shapes such as triangles, diamonds, and lines, creating a dynamic and structured look. It employs a rich color scheme with shades of red, yellow, blue, and earthy tones, which add vibrancy and warmth to the design. The inclusion of round motifs adds a three-dimensional effect and a touch of traditional artistry. The tapestry embodies a fusion of modern geometric design with traditional elements, symbolizing a balance between

contemporary aesthetics and cultural heritage. The geometric shapes represent order and modernity, while the hanging motifs evoke a sense of tradition and craftsmanship. Usage as a Wall Hanging When placed on the wall behind the reception desk, the tapestry becomes a captivating focal point that enhances the overall aesthetic of the reception area. This design is a versatile piece that can enhance both hotel receptions and villa interiors. Its vibrant colors, geometric patterns, and traditional motifs create a harmonious blend of modern and cultural elements.

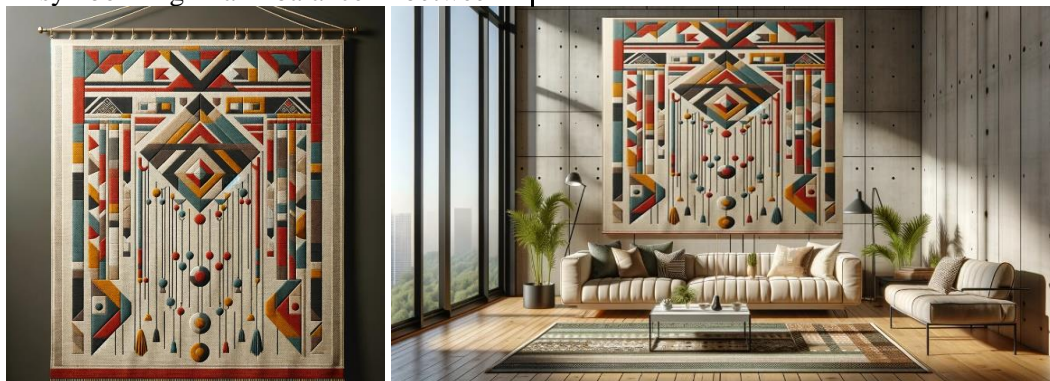


Fig. (21) illustrates the innovation design and its use in and its use hang wall in living room

#### The twenty two design:

The design is a vibrant and dynamic tapestry that employs a modern, geometric abstract style. The design is characterized by an intricate interplay of shapes, including circles, lines, rectangles, and arcs, all woven together in a harmonious yet complex composition. The use of concentric circles and

radial patterns might symbolize unity and continuity, while the straight lines and rectangular shapes add a sense of stability and order. The interplay of these elements creates a dynamic visual rhythm, making the tapestry an engaging piece of art that invites viewers to explore its details and interpretations. The color is warm and inviting,



featuring shades of orange, yellow, red, and blue, which are complemented by neutral tones like gray and beige. This combination of colors creates a sense of depth and movement within the piece. When hung on the wall, the tapestry transforms the space, serving as a focal point in the room. The geometric patterns and bold colors draw the eye, creating a visual anchor in an otherwise minimalist and contemporary setting. The tapestry not only

adds an artistic flair to the room but also introduces a sense of balance and symmetry through its structured yet fluid design. The philosophy behind this design seems to revolve around the idea of harmony and contrast. The juxtaposition of different geometric shapes symbolizes the coexistence of order and chaos, reflecting the complexity of modern life.



Fig. (22) illustrates the innovation design and its use in hang wall in living room

The design features a rich tapestry of geometric patterns, palm trees, and traditional cultural motifs. The earthy tones of beige, brown, and green create a serene landscape scene. The design combines modern geometric elements with traditional motifs, symbolizing the harmony between the past and present. The geometric patterns represent order and progress, while the natural motifs celebrate cultural heritage and simplicity. the design Ideal for living

rooms or entryways where it can be a focal point and Works well with neutral or earthy tones in furniture and accessories. The design was used in traveling bags' because the intricate patterns and earthy tones make the bag visually appealing and culturally rich. this versatile design enhances the aesthetic of home decor and personal accessories, blending modern geometric precision with traditional cultural elements.



Fig. (23) illustrates the innovation design and its use in hang wall in living room , chair and PC bag

### Some proposals for developing the craft textile industries sector:

The craft textile sector needs a comprehensive plan to overcome its unique challenges and capitalize on its strengths. By taking advantage of artificial intelligence, the following suggestions can be implemented:

- 1- Analyze the current capabilities of the artisanal textiles sector, including manual skills and technologies used.
- 2- Identify the main challenges facing the sector, such as high production costs, lack of skilled labor, and the need for innovation.
- 3- Highlight the cultural importance of artisanal textiles and the intrinsic heritage value to

preserve and promote heritage and cultural identity.

- 4- Integrate technology and provide craftsmen with digital design tools, e-commerce platforms, and quality control methods to improve operational efficiency and product quality.
- 5- Establish a regulatory framework that simplifies the licensing process, reduces bureaucracy, and encourages small textile companies.
- 6- Create dedicated funds and grant programs to help artisans and artisanal textile businesses develop, market, and expand products.



- 7- Increase networking opportunities by encouraging collaboration between artists, designers, and business people.
- 8- Promote sustainable artisanal textile practices such as natural dyes and organic ingredients.
- 9- Develop AI-driven marketing strategies to direct marketing campaigns more effectively to attract more customers.
- 10- encourage international exhibition increase access to craft textile markets through websites, and social media.
- 11- Establish craft textile research centers to encourage innovation, develop new methods, and create market-relevant designs.
- 12- Support poor artisans, Encouraging them to take pride in their traditional techniques and talents.
- 13- Implement translation and language localization techniques to help artisans access global markets by providing product descriptions and marketing materials in many languages using artificial intelligence.
- 14- The artisanal textile community, government, NGOs, and private sector actors must work together to achieve a comprehensive solution. By taking a comprehensive approach to the industry's interests and exploiting its cultural and artistic qualities, it may flourish and contribute to economic progress while preserving its history.
- 15- Textile modeling and simulation using AI: Simulates textile materials to allow artists to visualize finished items without prototypes. The virtual experience allows customers to visualize how the material will appear on them without trying it. This enhances online shopping and ensures the best design.
- 16- Artificial intelligence and robotics can automate processes and process designs that optimize and augment artisanal production processes, improve productivity, and reduce human error.
- 17- Automation must support human capabilities and efforts, and robots can address the aging workforce and shortages in craft industries by performing physically demanding tasks.
- 18- Create documentary videos on textile crafts using artificial intelligence and encourage access to them
- 19- Documenting textile handicrafts, including production processes, tools, sites, and museum collections, using artificial intelligence
- 20- Improving the skills of craftsmen through training programs and workshops. These programs must include traditional and modern methods specially AI technologies to improve production and design.
- 21- Collaborate with academic institutions to research AI applications in artisanal textiles.
- 22- Use AI-based design tools to create innovative patterns and designs.
- 23- Develop AI systems to provide customized designs based on customer preferences.
- 24- Implement AI-based quality control systems to detect defects and ensure the production of high-quality products.
- 25- Design systems that facilitate integration between human skills and AI technologies.
- 26- Establish policies for the ethical and responsible use of AI in the artisanal textiles sector.

### Results:

By embracing AI, small heritage industries can leverage this technology to enhance their cultural heritage. In addition, AI can help these small heritage industries create more efficient and cost-effective preservation strategies.

By embracing AI, small heritage industries can leverage this technology to enhance their cultural heritage. In addition, AI can help these small heritage industries create more efficient and cost-effective preservation strategies.

- 1- The development and revival of textile arts and crafts using artificial intelligence techniques reduce the unemployment rate, transform some groups that need assistance into productive groups, address some economic problems, and stimulate tourism.
- 2- Artificial intelligence techniques contribute to reviving textile arts and crafts and balanced regional development, covering urban and rural areas.
- 3- Artificial intelligence techniques contribute to raising the efficiency of textile craft industries, developing the product, and increasing production quality., drawing inspiration from the heritage and adding to it without distortion.
- 4- Developing the textile craft industries requires studying their cultural, heritage, and economic perspectives, showing their aesthetics, and emphasizing the national identity.
- 5- The textile craft industries help to achieve self-reliance because they depend on environmental raw materials and local human resources
- 6- Traditional craft products can only grow if they strengthen design innovation and actively respond to the market and their consumers' needs. Because of this, the study of traditional craft product design and innovation in today's intelligent period has immense practical significance
- 7- Continued research and innovations are needed to make AI technologies more explicable, compatible with human craftwork, and focused

- on complementing rather than copying craftsmanship.
- 8- AI contributes to developing craftsman designs, skill development, product quality improvement, marketing strategies, and enhanced product benefits.
  - 9- Virtual guides and interactive exhibits can help small heritage enterprises manage collections using AI technology to categorize and identify historical material.
  - 10- Automation can support human abilities and effort, and robotics can tackle workforce aging and craft industry successor shortages by doing physically demanding tasks
  - 11- AI contributes to the design process by enabling the creation of highly complex patterns that would be challenging to achieve manually. AI algorithms can process large sets of data and patterns, synthesizing them into new designs that maintain traditional aesthetics while introducing innovative twists.
  - 12- With AI, designers can easily adjust colors, patterns, and sizes, allowing for high levels of customization without the same time and labor costs associated with traditional methods. This flexibility makes it possible to tailor designs to specific spaces or customer preferences, enhancing the personal value of each piece.
  - 13- AI helps merge traditional textile patterns with contemporary design trends, creating pieces that are both timeless and modern. This blend appeals to a wide range of tastes, bridging the gap between different design eras and styles.
  - 14- Overall, the use of AI in the creation of these textile designs not only enhances their aesthetic and functional qualities but also helps in preserving and innovating traditional crafts. This technological integration ensures that such crafts continue to evolve and remain relevant in the modern design landscape, all while maintaining their intrinsic artistic and cultural values.
  - 15- Artificial Intelligence (AI) has become a transformative force in various industries, and its impact on the development of textile crafts design is particularly noteworthy. By integrating AI technologies, designers and artisans are able to enhance their creative processes, improve efficiency, and innovate in ways that were previously unimaginable.
  - 16- AI enhances the creative process through the use of tools like generative design software. This technology allows designers to input their design parameters and goals, after which the AI generates a range of options that meet these criteria. This not only speeds up the design process but also introduces a level of creativity

and innovation that can be hard to achieve manually.

- 17- AI also plays a critical role in customization and personalization, which are highly valued in the textile industry. Through AI, companies can offer bespoke products that cater to the specific tastes and preferences of individual customers without significant increases in production costs or time.

In essence, AI is reshaping the landscape of textile crafts, making it more innovative, efficient, and sustainable. As these technologies continue to evolve, their influence on the design and production processes in the textile industry is expected to grow even further, opening up new opportunities for creativity and business success.

### References:

- 1- Abisuga.,O, A. and Sirayi ,M. H. ,2018: The role of creative industries as a driver for a sustainable economy: a case of South Africa Oluwayemisi, *Creative Industries Journal* 11: 3
- 2- Al-Shafi'i., M.A. I., Al-Asfour., K. M. M. R. & Al-Sayyid., M. A. A. (2020): The Egyptian heritage and the rooting of the Egyptian identity in the design of woven lighting units. *Scientific Journal of the College of Specific Education*, Issue 7.
- 3- Anderson .,J. and Rainie., L. (2018): Improvements Ahead: How Humans And Ai Might Evolve Together In The Next Decade, *Artificial Intelligence And The Future Of Humans*, Pew Research Center december 10.
- 4- Cassin, Jack (1998). "Soumak and Kelim Weaving of the Caucasus: A Weaving Art Museum Exhibition". WAMRI- The Weaving Art Museum and, Research Institute.
- 5- Choubisa., B., Sinha., S .K, & Chattopadhyay., R (2020): Compression behavior of hand-tufted carpets: Part I–Effect of short-term static and dynamic loading, *Indian Journal of Fiber & Textile Research* Vol 45, June.
- 6- Deng., J., and Chen., X., (2021): Research on Artificial Intelligence Interaction in Computer-Aided Arts and Crafts", *Mobile Information Systems*, vol. 2021, Article ID 5519257, <https://doi.org/10.1155/2021/5519257>
- 7- Gad Elrab, H. (2021): The Project of Developing the Traditional and Heritage Crafts and The Local Industries at the Villages of Upper Egypt and the red Sea, *International Journal Of Eco-Cultural Tourism, Hospitality Planning And Development*, Volume 4, Issue 2.
- 8- Guo, R., Lin, J., Narayanan, V., & McCann, J. (2020). Representing Crochet with Stitch



- Meshes. In SCF 2020: ACM Symposium on Computational Fabrication, 1–8.
- 9- Gupta., S. K., Majumdar.,A.& Goswami., K. K. (2017): Compressional behavior of Persian hand knotted wool carpets using response surface methodology, *Indian Journal of Fiber & Textile Research* , Vol. 42, December
  - 10- Han, J. I., (2011): A Study on the Characteristics of the Designs on Coptic Textiles of Ancient Egypt, *Journal of Fashion Business*, Volume 15 Issue 3
  - 11- Hashem., A. M., Ashmawy., S. A.and Allam., A. F. (2022): Applied methods of hand tufting carpets as a source for designing and producing textile pendants with Egyptian character and identity, *journal of architecture, Art & Humanistic Science*, Issued by the arab association of civilization and islamic arts, volume 7, Issue 33, May.
  - 12- Holt., R. B., (2009): Rugs: Oriental and Occidental, *Antique & Modern*, September 19, 2009 [EBook #30025], Juliet Sutherland and the Online Distributed, <https://www.pgdp.net>
  - 13- Ishaq .,H. F. (2017): The Thought and Art of Modern Handmade Weaving, *Dar Al-Kitab Al-Hadith*, 1 st edition
  - 14- Ismaiel., A. M. A. H. and Yousef., R. A.H. (2022): Artificial intelligence and its applications in the garment industry, *International Design Journal*, Volume 12, Issue 3, May.
  - 15- Jørgensen., L. B., Eicher., A., R. and Wendrich., W. (2023): Earliest Evidence for Textile Technologies, The Palaeolithic of the Arabian Peninsula: State of Research, *Journal supported by the Institut des sciences humaines et sociales (InSHS) of the CNRS*.
  - 16- Karaman, O. (2015). Revival of traditional crafts through fashion: The case of Turkish ikat textiles. *International Journal of Fashion Design, Technology, and Education*, 8(1).
  - 17- Kirk.,V. (1999) : Scottish tapestry tradition, technique, narrative and innovation: its influence on Australian woven tapestry 1976-1996, Master of Arts, University of Wollongong.
  - 18- Marouf, M. A. (2005) “Technical Analysis of Tapestry” *International Conference in field of Conservation (The Concept of Conservation and Restoration of Objects: An Applied Study of the Ekhnaton Museum)* 17-18 march 2005, Faculty of Fine Arts, Al Minia University.
  - 19- Darbanhosseiniamirkhiz., M., Shabanifar., S, and Ismail., W., K. W , 2011: Adoption of Technology in the Hand Woven Carpet Industry: The Case of Alinasab Carpet Company, *Australian Journal of Basic and Applied Sciences*, 5(10)
  - 20- More .,J. Fassett .,K. Mcarthur.,C., Rogoyska .,M. and Wright., H. (1992) : *Tapestry: Art, Craft and Collaboration* , *RSA Journal* , Vol. 140, No. 5433 ,October
  - 21- Pal, R. 2017. *Sustainable Design and Business Models in Textile and Fashion Industry*, In *Sustainability in the Textile Industry* , *Textile Science and Clothing Technology*, Springer Nature, Singapore.
  - 22- Sanchini., L. M. A. ( 2018) : “We are the Rug Hooking Capital of the World”: Understanding Chéticamp Rugs (1927-2017) , A thesis submitted to the School of Graduate Studies In partial fulfilment of the Requirements for the degree of Doctor of Philosophy, Department of Folklore , Memorial University , December .
  - 23- Sikka .,M.P. Sarkar .,A. and Garg., S.(2022) “Artificial intelligence (AI) in textile industry operational modernization, *Research Journal of Textile and Apparel*,April.
  - 24- Terry ., M. E. (1999) : *The Economic and Social Significance of the Handicraft Industry in Botswana Volume I*, The School o f Oriental and African Studies, University of London for the degree of Doctor of Philosophy
  - 25- Tlostanova, M. V. (2019). *The Global Craft Sector: Tradition, Innovation and Cultural Goods*. In *International Handbook of Globalization and World Cities*
  - 26- Xiang ., Shishi, Niu ., Z. , and Wu .,Y . ( 2022) : *Research on Handicraft Design Based on Artificial Intelligence Technology in Complex Environments*", *Wireless Communications and Mobile Computing*, vol. 2022, Article ID 1538488, 9 pages, 2022. <https://doi.org/10.1155/2022/1538488>
  - 27- Yassin., N. M . I .,(2020) : *Traditional Industries To Confirm The Identity of The Source Print One-Piece Design For Ladies Clothing* , *International Journal of Design and Fashion Studies*, Volume 3, Issue 2.