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Elucidation of relationship between clothing silhouette and motifs with Indian Mughal architecture

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Abstract

Fashion adopts numerous creative ideas and the designers source them. Architecture is also not left out from the eye of designers. Fashion designers used to take their inspiration from architectural buildings normally to create new clothing silhouettes. But what is important to understand here is the nature of relationship between these two disciplines which made them to do so. Keeping this fact in mind, researcher tried to find the connection between 'Fashion' and 'Architecture,' which can serve as fashion element for designers. Clothing Silhouette and motif were the two criteria on which the relationship was investigated. Indian Mughal architectural monuments were selected, since Mughals were considered as the most influential rulers on Indian sub-continent, having unique heritage in terms of religion, arts, music and other ornamental techniques which are in vogue even in the modern era. The outcomes show that similar kind of motifs was used to ornament both textiles as well as walls of architectural monuments at same time frame. Clothing silhouettes of that time were also inspired from the outer shape of the monument. Further, while investigating, a functional aspect—one of the common causes of relationship in terms of comfort in both the disciplines was also found.

Keywords: Fashion and architecture, Silhouettes, Floral motifs, Mughal costumes, Mughal monuments, Dome structure, Clothing comfort

Introduction

In the present era, designers should be creative enough but to follow 'Fast Fashion.' Fast Fashion emphasized on quick and inexpensive clothing styles for mainstream consumer at lower price. Designers are trying hard to be competitive, apart from being creative for each and every fashion collection. Inspiration can flow via anything i.e., species, phenomenon and natural objects and so on, but generally comes from surroundings. Architectural monuments can be a fair source of inspiration for various designs, silhouette types, and motifs and even can act as a prototype for new design concept representation; which further reduce clothing cycle lead time. Another positive aspect of architecture is to be a classic source of inspiration and centre of attraction; as people attract towards the intricacy of design and shape of architecture. Therefore; the study of relationship between clothing and architecture can support towards better creative ideas to

serve 'Fast Fashion.' In similar line; Lucy Ortha tried to break the boundaries and showed contemporary relationship between architecture and fashion design based on materials, techniques, images and vision which includes her art of tent like clothing structures (Quinn 2003). Some other designers also got inspired with architectural buildings including Paco Rabanne, who created outfits with metal platelets, pieces of glass or wooden balls, inspired by Frank Gehry's Guggenheim Museum (Hedayat 2012). It is also important here to underline that; designers and architects both can interchangeably get inspired from each other. Usually fashion professionals directly or indirectly include abstracts of architectural motifs in their collection but the fact is overshadowed that there may be some connection between these two disciplines and this link further can facilitate 'Fast Fashion.' The present paper also attempts to establish from written sources the possible inter connection between the motif/pattern used, Silhouette corresponding to inlay work, engravings and Mughal monument's shape. The costumes and Mughal monuments provide the rich heritage of art, embellishment in progressive sequence during sixteenth to seventeenth century as practised under Akbar (r. 1556–1605), Jahangir (r. 1605–1627), and Shah Jahan (r. 1628–1658) and Aurangzeb (r. 1658–1707).

Literature review

Few researchers have started working in the direction of conglomeration of these two fields. Such works are illustrated in this section to find out the research gap.

In both fashion and architecture, designers started to develop structural skins that bring the "Skin and the Bones"—together so they become one and the same thing showing structure and façade? joined in a single surface (Miles 2018).

Devetak got inspiration from Maks Fabiani's complex architectural design premises, personal emotional experiences and translated them into garments by implementing creative patterns using standard matrix of basic blocks and of sculptural work by creating three-dimensional paper garment forms by doing case study called F² (Fabiani Fashion) which further showed that the architecture provide fashion design with an inspirational background and understanding the emergence of architecture in fashion design (Devetak 2016).

Menon et al. evaluated Mughal architecture that has taken inspiration from minarets, domes, pillars, guldasta (flower pot) and Pistaq and designed 4 to 6 year children's gowns. The clothing was made to imitate with the architecture's building; which contains Satin, crepe, lace and net fabric materials with marble colour, domes, minarets and surface ornamentation and did a survey to check the adaptability of designs among consumers and these dresses were useful to carry forward the cultural values to the next generation as well (Menon and Swetha 2016).

Ertas and Samlioglu too discussed the differences/similarities of fashion design and architectural design also viewed in an architect's point of view and observed similarity in philosophy of design process and differences in terms of information and material used using sack draped on students to imitate costumes (Ertas and Samlioglu 2015).

Farahat also concluded the relationship by observing the influence of art, technology and science and material characteristics (Massive/Rigid, glossiness, transparency, colour) on both the disciplines. The examples, review analysis were included to demonstrate the relationship; named as 'Mondrian Art,' Hussein Chalayan collection inspired

from science and technology, Frozen Aura, a flowing Mess dress; particularly inspired from The Thyssenkrupp Headquarters in Germany; Balenciaga Spring 2008 collection inspired with The Guggenheim Museum and the satin fabric and titanium glossiness used for fashion and architecture, respectively (Farahat 2014).

King and Clement argued about the mutual influential creations developed in both fashion and architecture using interdisciplinary works. Fashion inspired the architecture in case of 'Bauhaus,' a source of building which was inspired from Wassily Kandinsky's fashion designs showed in 1920's and vice versa demonstrated in case of 'Mobius Dress,' showed inherently inside-out and outside-in garment to show interiority and exteriority like architectural structure (King and Clement 2012).

Some fashion articles also states about the linkage between architecture and fashion; again in terms of mutually inspired from each other. It includes some world's famous designers who got inspired from architecture; includes Calvin Klein (2008) 'Ready-to-wear collection,' Victor and Rolf, Nicolas Ghesquiere, Louis Vuitton, etc. and the architects who designed fashion products named as Frank Gehry, Zaha Hadid Iraq, Fernando Garcia etc., and deduced a connection in terms of interdisciplinary inspirational creations (Bobila 2017; Essays 2013).

Literature supported that from ages, designers directly or indirectly got inspired from architectural buildings. Some scholars, designers and architects also sensed a sort of relationship between these two disciplines. They tried to show this relationship on the basis of demonstrating the examples of designers who created their clothing silhouettes by taking architectural monuments as an inspiration and also most of the finding being taken from recent past (twentieth or twenty first century examples). But the cause of this relationship was not addressed properly. Therefore, the research gap can be addressed by investigation of the parameters which are responsible to cause the interrelationship between the studied areas. So, the researcher tried to showcase the relationship in terms of 'Silhouettes' and 'Motifs' used; which are the most influential elements of any fashion collection. Mughal emperors paid special attention to textile patterning, cuts and delicate hand work on their garments (Sharma and Panwar 2012). Indian Mughal era's costumes and architectural monuments were very rich in design craftsmanship and intricacy and chosen to satisfy the research argument and to observe the kind of relationship between the two disciplines in terms of silhouette type and motifs used in further sections.

Methods

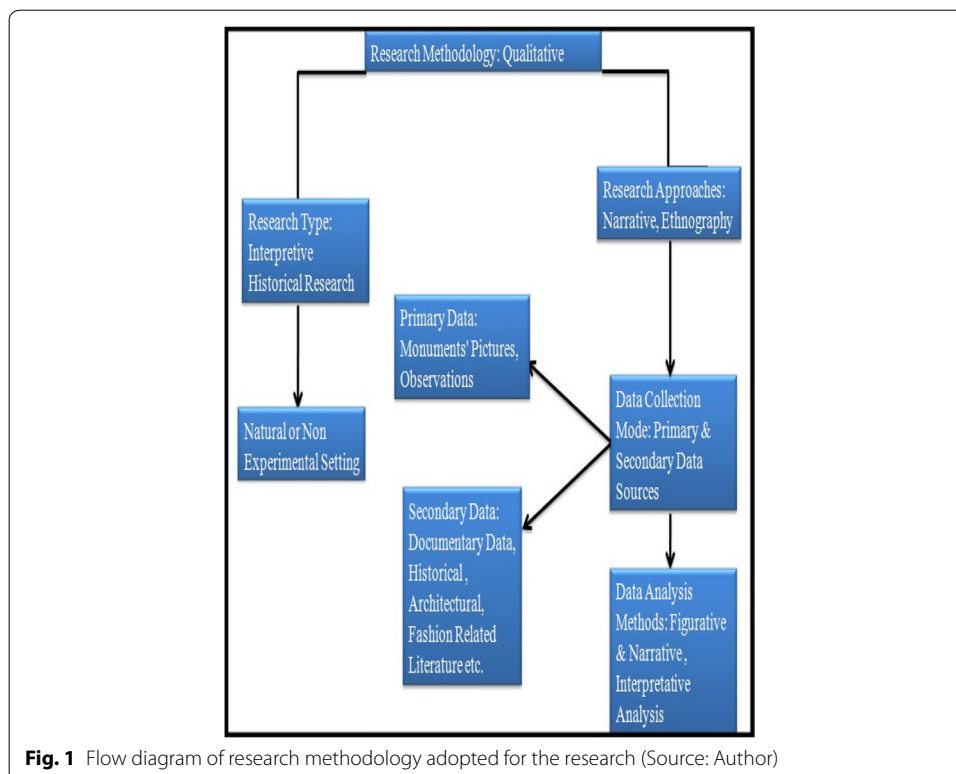
There are four approaches of qualitative research in architecture and the special approach for historical research is called the interpretive-historical approach (Khazare et al. 2015). Interpretive research defined specifically as investigations into social-physical phenomena within complex contexts, with a view toward explaining those phenomena in narrative form and in a holistic fashion (Groat and Wang 2013).

Methods in qualitative research are generally open-ended and in-depth, and naturalistic, that is, they attempt to study things, people and events in a natural (non-experimental) setting (Kielmann et al. 2012). To accomplish the research; a qualitative research methodology has been adopted; which is best suited to analyze Mughal era (Akhbar's to Aurangzeb's reign) specifically taken as research area due to its rich and flourish artistic

activities altogether including clothing and architecture. Therefore, historical data collection and interpretation was the prime most tasks, which serves as a base for research including secondary data sources. Figure 1 indicates the stepwise research methodology adopted for data collection and interpretation to meet given research's unique requirements.

Qualitative methodology is a flexible approach; as it can use multiple methods to examine the same question or area. It includes interviews, field study, document studies, surveys, ethnographic observations, visuals, narratives descriptions etc. But researcher has adopted ethnographic observations; document studies, field work etc. for data collection and validation. In addition; the finest way to represent motifs, monumental structures is the figurative demonstrations. In interpretive research design, meaning-making is a key to the scientific endeavour; the very purpose is to understand how specific human beings in particular times and locales make sense of their worlds, and because sense-making is always contextual, a concern with 'contextuality'- rather than 'generalizability'- motivates research practice and design (Serhun 2013).

Historical inquiry is very similar to qualitative inquiries in general. In each case, the researcher attempts to collect as much evidence as possible concerning a complex social phenomenon and seeks to provide an account of that phenomenon. The process involves searching for evidences, collecting and organizing that evidence, evaluating it and constructing a narrative from the evidence that is holistic and believable. Throughout the process, interpretation is the key (Groat and Wang 2013). In similar line, in the current study the relative evidences in terms of silhouettes and motifs were collected for architecture and Clothing for Mughal era between sixteenth and seventeenth century; then

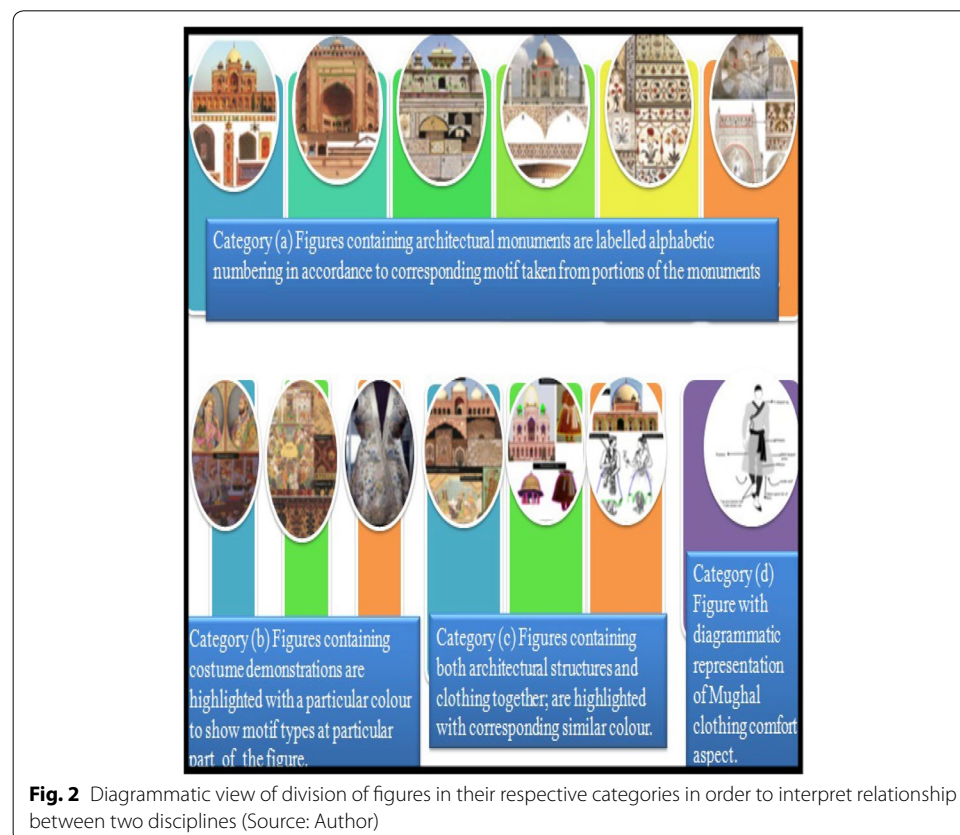


organization of related elements from Mughal emperor Akbar to Aurangzeb's region and the evaluation of collected evidences were analyzed through field study observations, figurative analysis and the contextual narrations/related literature corresponding to similar elements throughout in the discussion section. Micklewright too mentioned a about a history base costume enquiry; there are three most obvious and important categories of evidence collecting sources- visual representations of dress, archaeological evidence and textural descriptions (Micklewright 2018). Figures were used as a tool to show visual representations of Mughal attire, monument's pictures and to fulfil the special requirement of article for presentation of collected field data along with connectivity analysis; therefore the demonstration has been divided into four different categories shown in Fig. 2. Edition and development of illustrations was done with the help Adobe Photoshop CS6 (64-bit), Coral-Draw X6 (64-bit) application software.

Costumes of Mughal era are rarely accessible or available, so documentary literature supported the argument. All the architectural monuments are analyzed in their present day condition.

Results and discussion

Interpretive research supports historic theories, explanations, observations; supporting literature etc. to do analysis to solve the analogy of interdisciplinary research relationship. To carry out present research work architectural monuments were observed along with the field study at their present state and corresponding clothing type supported by



historic literature references. This section further elaborates the reign-wise motifs and silhouettes used for clothing and structural shapes of monuments starting from Akbar's region to Aurangzeb's reign. Initial Mughal emperors like Babar (1526–1530) and his successors ruled North India until 1858, were called as 'Mughals' (Asher 2001). Babar and Humayun's (1530–1556) retained the clothing of his homeland "Turkestan" due to religious reasons and later in Humayun's reign slight modifications only in terms of colour has been started (Kumar 1999). The substantial influencing period for culture, economy, art and political development was initiated from Akbar's reign (Asher 2001). Therefore, the researcher had chosen to study design patterns and silhouette of clothing from Akbar's to Aurangzeb's reign in Indian sub-continent due to significant modifications in aesthetic and functional aspects of clothing. First analogy of motifs was presented, accompanied by silhouettes types elaborated later.

Similarity of motif/pattern for architecture and costumes of Mughal empire

Motif is an element of pattern, image, or part of one, or more themes. It can be an idea which incorporates lines in various forms, such as horizontal, vertical, curved and diagonal. Motif is a design that consists of recurring shapes or colours, theme that elaborated on in a piece of unifying idea that is a recurrent element in a literary or artistic work. It can also call as decorative art. A design initiate with a motif and the repetition of a particular motif at certain intervals over a surface is called pattern. Repetition of this pattern creates a design (Textile designing 2013). Broadly motifs used in Indian Mughal era can be classified into four different categories: Islamic Geometrical motifs, Naturalistic floral motifs, stylized floral motifs and abstract motifs. The Islamic Geometric patterns (IGPs) are based on constructive polygons such as hexagon and octagon. By connecting vertex of these shapes, star-polygons will appear which are considered as fundamental element of Islamic geometrical patterns. For instance, all patterns in which their main elements are from hexagon or hexagon-star is called as 6-point star. Accordingly, patterns are further called as 8, 10, 12, 14, 16... point geometrical patterns (Abdullahi and Embi 2013). Natural motifs, as name suggests inspired from nature including flower leaves, vines, birds and animals embroidered on different garment very close to natural designs and motifs (Textile Designing 2013). Stylized motifs lose its natural form as it becomes more decorative and stylized. Thus the motifs which have more curves and details are away from their natural form and look more complicated such motifs are called stylized motifs (Textile Designing 2013). In abstract motifs only textures, veins, colour, patterns used to copy from natural species and also known as non-figurative design (Textile Designing 2013).

Mughal era is known for its decorative art and intricate and perfection of designing and placement of motifs and how the above mentioned varieties of design patterns were practised on textiles and architectural constructions in Mughal period is described reign wise in further sections.

Akbar's reign (1556–1605)

Akbar was the third Mughal Emperor and also the architect of the Mughal Empire in India. Akbar built some of the best architectural monuments including Humayun's Tomb, rebuilt Agra Fort, the fort-city of Fatehpur Sikri, and the Buland Darwaza and many

others. The geometrical designs gained prominence only during early Mughal rulers or up to the age of Akbar. Akbar's historical monuments have also mainly geometrical inlay designs (Sharma 2016). Mausoleum of Humayun in Delhi (1556–1566 CE) is complex consisting of samples of 6 and 8-point geometrical patterns can be found through marble floorings, window grilles and balcony railings. Buildings of same era have dominant 6 and 8-point geometrical pattern is also repeated in Red Fort of Agra (1564–1580) (Embi and Abdullahi 2012). The motif used in both textiles and monuments were geometrical. Initially the geometrical shapes like squares, rectangles, triangles, etc., were used; later, shapes started taking curves in architectural monuments (Krishna and Krishna 1966). The costumes of Akbar's reign had shadow of geometrical patterns and also seen in Mughal's court costumes (Lari 2010). In addition, the field study also suggested that geometrical patterns were present on early constructions of Akbar's reign and presented on mausoleum of Humayun and Buland Darwaja. Figures 3 and 4 illustrate Humayun's tomb and Buland Darwaja, respectively to show geometrical motifs; and lately in Fig. 4; motifs became curvy in case for Buland Darwaja. Textiles of Akbar's era lately found mainly the designs of flower buds with straight leaves and stems, whereas Jahangir's reign exhibits fully bloomed flowers with tender and flexible stems with curved and twisted leaves (Lari 2010). Consequently, in Akbar's reign both the disciplines shared relationship in terms of geometrical motifs and the motifs became curvy later simultaneously for both textiles and monuments with in similar time frame.

Jahangir's reign (1605–1627)

In the early, Mughal textile designs were naturalistic in nature and the botanical books featuring highly detailed, block-printed images of plants are thought to have intrigued



Fig. 3 Humayun's tomb with its geometrical motifs (Source: The Author)

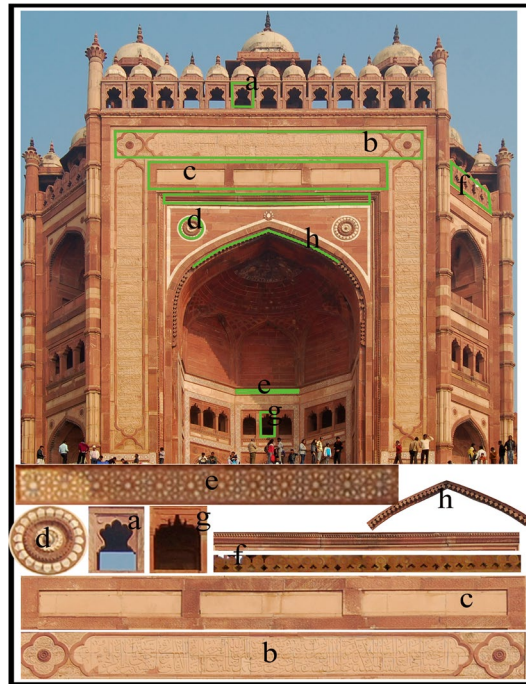


Fig. 4 Buland Darwaja with its geometrical and curved motifs (Source: The Author)

Mughal artists (Schuster and Michael 2008). Realistic representation of flowers and plants are often classed as botanical (Wilson 2001). During the period of 1620 to 1670, a number of botanical paintings of Mansur; who was the best artist working under Jahangir and empress Nur Jahan's multitude artistic motifs were successfully transformed into textile designs (Welch 1963) (Jahangir 1909–1914). The empress had great sense of aesthetics for textiles and introduced a delicate embroidery art 'Chikankari' in which various floral motifs were used of that time (Kumar, 1999). The most famous Mughal motifs were iris and narcissus flowers; frequently used in the borders with tulips, red roses and lilies. Kashmir shawls were the main garment examples on which floral motifs were used extensively (Coomaraswamy 1923). Floral printed pyjamas were also noticed in the period of Emperor Jahangir. In Fig. 5 also shown a Riding coat, from court of Jahangir, embellished with botanical motifs portrayed on it; which demonstrated the multitude of artistic motifs used at that times (Jahangir 1909–1914).

Nur Jahan, queen of Jahangir, built (1627–27) the tomb for her father Itimad-ud-Daula, which has the inlay work of precious and semi-precious stones with different motifs such as floral, cypresses, creeper, wine glasses, birds and an amazing variety of geometrical arabesque (Sharma et al. 2009). Plants, flowers, vines were generally used in the borders with carving or inlaying them with precious stones mounting on Hashiya (border). These vegetal patterns, curves and arabesque scrolls show its great resemblance to Persian art and miniature painting. Borders with birds, butterflies and bright coloured flowers became a distinctive feature of Mughal buildings like Tomb of Akbar at Sikandra and Mausoleum of Itimad-ud-Daula (Jamil and Gulzar 2017). Some miniatures in which the Mughal's were wearing the costumes patterned with animal figures. During the reign of early Mughals probably during Akbar and Jahangir the animal, bird's figures



Fig. 5 Riding coat, from court of Jahangir (Source: Houghteling (2015). 'The Emperor's Humbler Clothes: Textures of Courtly Dress in Seventeenth Century South Asia.' *ARS ORIENTALIS*, vol. 47, 91–116. <https://doi.org/10.3998/ars.13441566.0047.005>)

were used on large scale in costumes and textiles (Walker 1997). The grave of Itimad-ud-Daula, the decoration is done with some flowers, patterns of vases, within niches, scrolling vines and blossoms, which are Persian in origin. This all was more or less similarly applied on costumes (Walker 1997). The observational study indicates that the tomb consist the most intricate designs, pierced inlaid stones, on which the decoration was done with similar flowers, patterns of vases, within niches and blossoms, which were Persian in origin as on textiles and represented in Fig. 6.

Jahangir had a fine artistic sense and had more love and interest for miniature painting than in architecture. Jahangir et al. stated that Mughal painting reaches its peak of accomplishment during Jahangir's period. Because of their beauty and aesthetic sense on miniatures Jahangir utilized this form of art on the dadoes of Mughal buildings in white marble panels (Jamil and Gulzar 2017). In early seventeenth century, Mughal's introduced a change in textile surface ornamentation and designs. Their appeared multi-coloured designs combined with gold and silver thread. The pattern of these textile designs took inspiration from the Mughal court paintings. The geometrical and floral motifs of Hashiya (border) of these paintings were the main source for the textile designs (Chaudhary 2015). Walker also acknowledged that the entire monumental flower motifs were more or less similarly applied on costumes of that time (Walker 1997). The correlation scrutiny of Figs. 5 and 6, and related literature is not only pointing towards the similarity of botanical patterns used but also the presence of these on that walls of Itimad-ud-Daula's tomb and Riding coat was strengthening the bond.

Shah Jahan's reign (1628–1658)

Shah Jahan reign was widely considered to be the golden age of Mughal architecture. The emperor was passionate about architecture and was known as "The great Mughal Builder" (Kumar 1999). Shah Jahan commissioned many monuments, the best known of

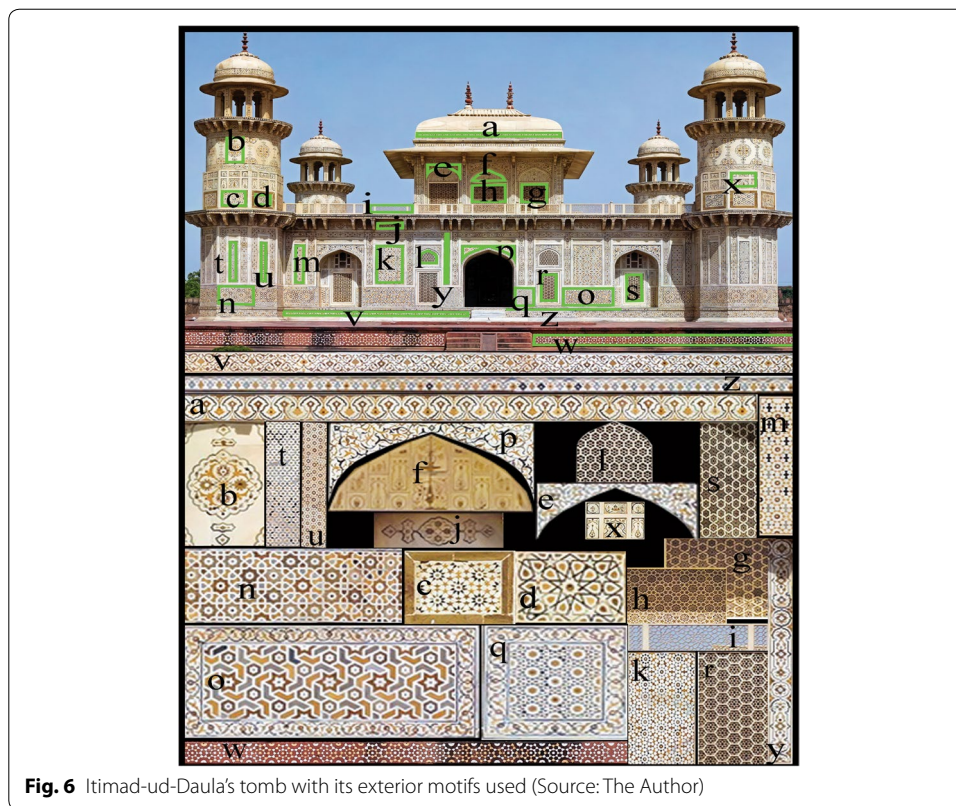


Fig. 6 Itimad-ud-Daula's tomb with its exterior motifs used (Source: The Author)

which is the Taj Mahal in Agra, which entombs his beloved wife Mumtaz Mahal. Shah Jahan was considered the great lover of architecture and gardens and marked the predominance of stylized motifs with curves and details are away from their natural form and look more complicated (Welch 1963); as shown in Fig. 7 in form of Taj Mahal's exterior.

Nature was drawn on clothes in Emperor Shah Jahan's reign. The floral designs were used according to the quality of fabric and technique of production of clothes (Krishna 1997). 'Buti' was a type of motif in which a single flower was made on the cloth. The word 'Buti' is derived from the Latin word 'Butia' a composition of a shrub or flower into a pattern (Krishna and Krishna 1966). In Fig. 8 illustration (a, b) Mumtaz Mahal and Shah Jahan's paintings and in illustration Fig. 8c also 'Buti' motifs were showed on the dresses of common gathering of people for king Shah Jhan's birthday; strengthening the fact that in Shan Jahan's sovereignty floral patterns were predominantly used on textiles. Combination of various types of motif like; calligraphic, abstract and stylized floral motifs are common on much of Islamic architecture but floral motifs are prevalent as compared to others (Koch 2006). Other different type of flowers such as narcissi, rose, poppy, tulip, marigold, jasmine, lotus and champa were used in highly stylized way on clothes and carpets (Agarwal 2003). Many varieties of flowers identified at the centre of upper chamber of dome of mausoleum including irises, tulips and narcissi are also present on the walls of Taj Mahal's mausoleum indicating a clear sense of coherence in the overall design decorative program (Koch 2006, p. 158). Inside the mausoleum, at upper horizontal Jali border on the outer face of marble screen (interior) of Taj Mahal,

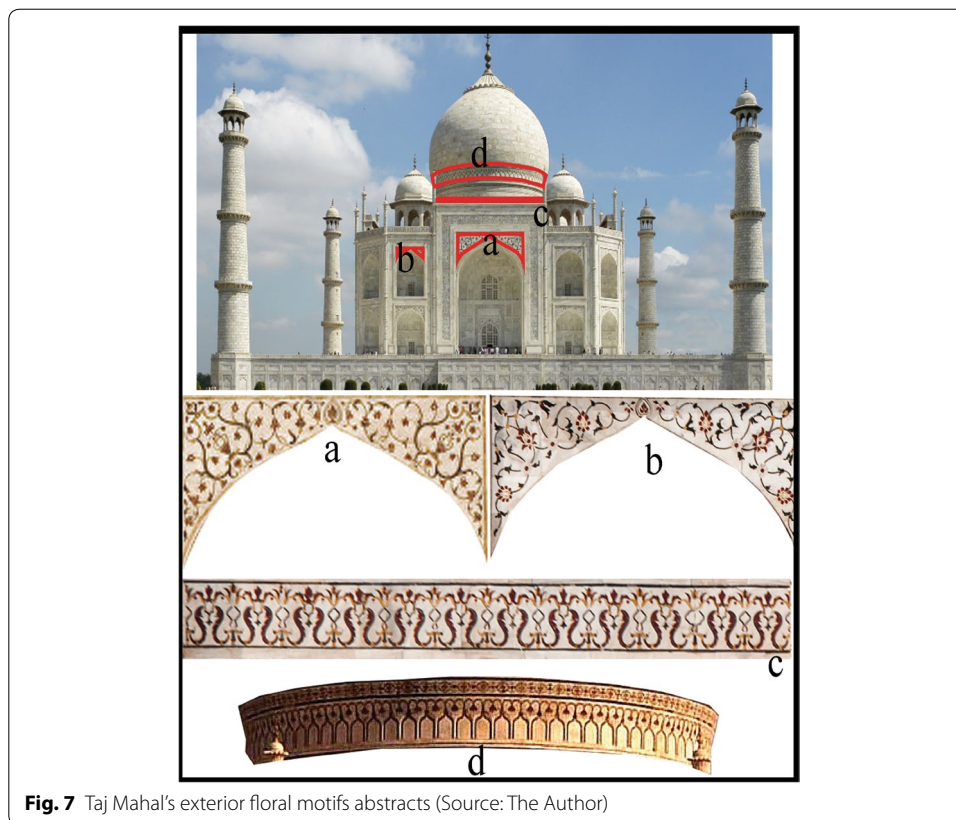
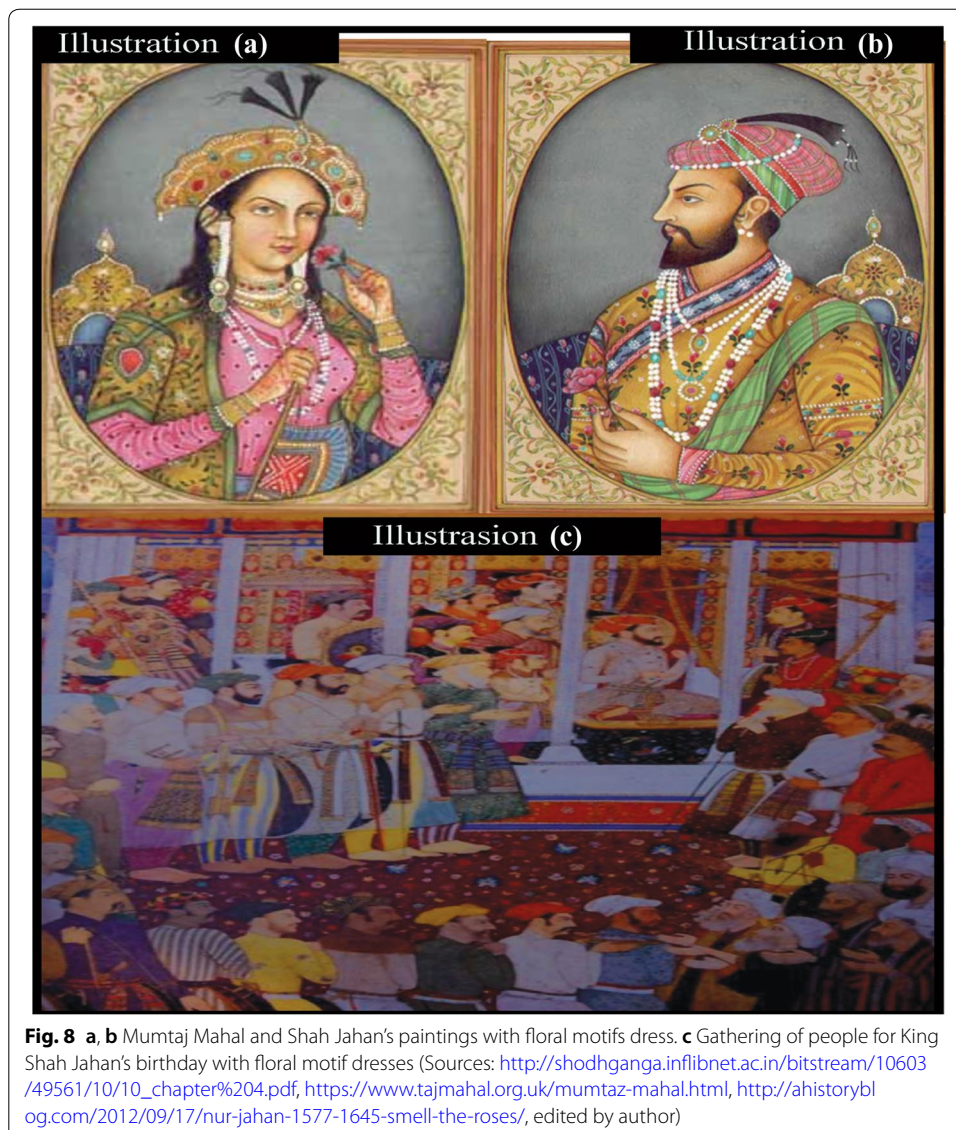


Fig. 7 Taj Mahal's exterior floral motifs abstracts (Source: The Author)

a flowering plants are individual fully flowering lotus are also identified known as chrysanthemum (Koch 2006, p. 171). The inner face of frieze in Taj Mahal is decorated uniformly with plants showing three heads of five and six petalled flowers with two small buds below, similar to the blooms of a champa tree and also resembles the Mughal artist Mansur's depiction of western Asiatic tulip (Kennedy 2007). The flowers generally used in Mughal textile designs were taken from Persian carpet motifs. These motifs were used in costumes, architecture and jewellery simultaneously (Krishna 1997).

During Shah Jahan's sway itself, pictures and portraits drawn by the weavers on Brocade saris; also known as pictorial brocades or "Tasvir." Running patterns comprising flowers and leaves were called "Bel." A number of these patterns were in used included 'Adibel, daubel' 'Khajuribel,' 'Gendakibel,' 'Cane pattikabel,' overall known as "Phulwar." (Krishna and Krishna 1966). Figure 9; illustration (a) shows clothing with highlighted with green outline having 'Bel' floral motifs in Mughal court costumes and in similar line; illustrations Fig. 9 (b–e) also having 'Bel' motif patterns on carpets during that age. The cenotaph of Shah Jahan and his wife has a band of individual flowering plants (Kennedy 2007) which resembles to 'Bel' pattern. Flowering plants motifs were dominated in Mughal art; such motifs were not only employed in border decoration of the Mughal costumes but also on the surface decoration of buildings like Pietra Dura work appeared in the building as the Taj Mahal and the Red Fort Welch et al. 1987). The observational study also states that the Taj Mahal is also decorated with floral motifs along with 'Bel' work, buti work within motifs, usage of various stone embedded and



carved flowers both its exterior and, interior walls, borders. As in Figs. 7, 10 and 11 illustrated; the Taj Mahal's exterior, interior embedded coloured stone floral stylized motifs and interior stone carved floral repeat patterns, shows flourish floral design usage.

Early Mughal motifs were bold, simple and there was an ample space between the motifs. Designs stood out prominently against the background. The combination of basic and additional decorative elements led to the development of complex patterns. During the reign of Shah Jahan the gap between the motifs disappeared because an intervening space was filled with similar motifs (Welch et al. 1987, p. 45). Jahangir's reign was known for more realistic nature depiction as motifs on clothes and architecture but at the time of Emperor Shah Jahan the natural objects or motifs were more perfect and arranged in a symmetrical manner. If leaves and flowers of the plant do not balance properly, other elements are added to gain symmetry in Mughal costumes (Krishna 1997). By analysing the Taj Mahal, it was found that the geometric planning, symmetry and attention to



detail and claims that ‘there is a perfect symmetrical planning with emphasis on bilateral symmetry along a central axis on which are placed the main features (Koch 2005). Hence, the relationship between the two disciplines was arrived in terms of usage of similar floral designs with added symmetry.

Aurangzeb's reign (1658–1707)

The designs of Aurangzeb's period were the repetitions of motifs used during the reign of Shah Jahan (Agarwal 2003). During the reign of Shah Jahan the extensive ornamentation in both architecture and textiles with prominence of floral design duplications during his reign, a high quality of floral ornamentation combined with gold and silver work was used and all this continued during the reign of Aurangzeb (Chaudhary 2015, p. 44). In the Badshahi Mosque, inlaid work on flat surface and in low relief have been executed with perfect technique; decorative floral motifs were cut out of the white marble and



Fig. 10 Tajmahal's interior embedded coloured stone floral motifs (Source: The Author)

inlaid on red stone in flat and embossed manner (Nasim 2012). Khan writes about the floral ornamentation of Badshahi Mosque and says that it has bold relief inlay of white marble on red sand stone background on its entire exterior (Khan 1991). Figure 12a represents the most famous architectural mosque named 'Badshahi Masjid' (built in 1673) along with its exterior interior floral ornamental patterns and Fig. 12b shows (highlighted with green colour) the floral designs dresses from Aurangzeb's court and Aurangzeb himself. From these illustrations, it is revealed that monuments during Aurangzeb's period of influence support the research argument.

Hence, the reign-wise analysis of motifs used to decorate surface of costumes and buildings of Mughal era signifies resemblance for selected disciplines. These design patterns were more or less portrayed in similar manner for selected research areas; depending on raw material to be used to craft them. The Designs are always used according to the material. Designs are not merely copying of the motifs but it shows the concept of patterns and traditions (Krishna 1997).

This section of study revealed the relationship of past heritage of aesthetic parameters in terms of surface design patterns of clothing and Architecture, the integration of two fields can keep the past evidences of their existence; distinctively for textiles which usually difficult to preserve due to its self deterioration. The design patterns can be replicated directly from architecture; which perhaps rare to find in textile forms. The motifs can be directly duplicated or in modified version. For an instance, the kind of inlay work

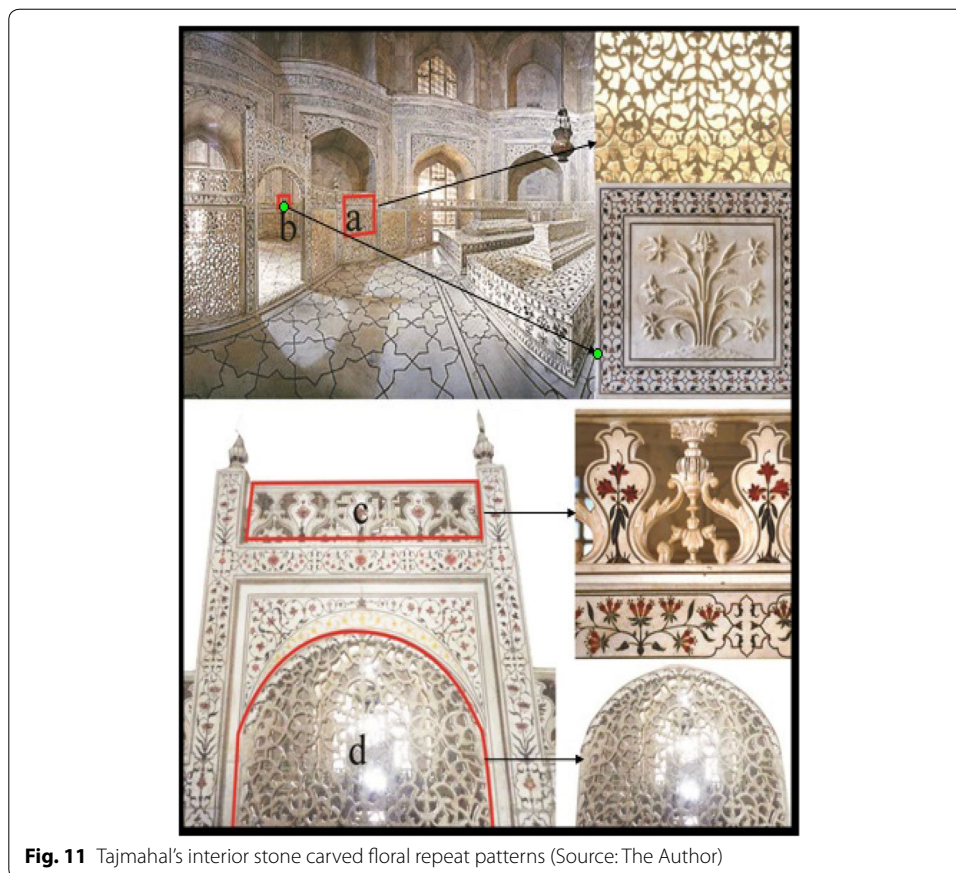


Fig. 11 Tajmahal's interior stone carved floral repeat patterns (Source: The Author)

present on monument's; especially Taj Mahal can be transformed in form of fabric's surface ornamentations like embroidery, prints etc. Alothman and Akcay also mentioned that; the integration of fashion and architecture is an exciting way to express identity through contemporary ways and it is unique movement in the revival of heritage (Alothman and Akcay 2018).

Murphy's study also explores London fashion designer's use of historic garments for research and inspiration for their collections by taking examples of work by graduates from the Royal College of Art, two established designers Nemed Stuart Stockdale, Design director at Jaeger and Barry Tulip, Senior Designer at Danhill, and an interview with Professor Wendy Dagworthy, Head of fashion at the RCA and revealed by taking various designer's collection examples which were successful is that surviving garments, whether in museum collections, vintage shops or company archives provide an invaluable lexicon of reference material to draw from (Murphy 2011). Hence Mughal era historic heritage also can be act as the base for creation of another derivative of contemporary fashion with modifications of its existing design elements.

Similarity in clothing silhouette and architectural shape

From literature review analysis; it was found that the apart of clothing silhouettes of Mughal era was inspired from outer shape of architecture or few cases vice versa. The source of inspiration taken to design their fashion collection; usually be mention by

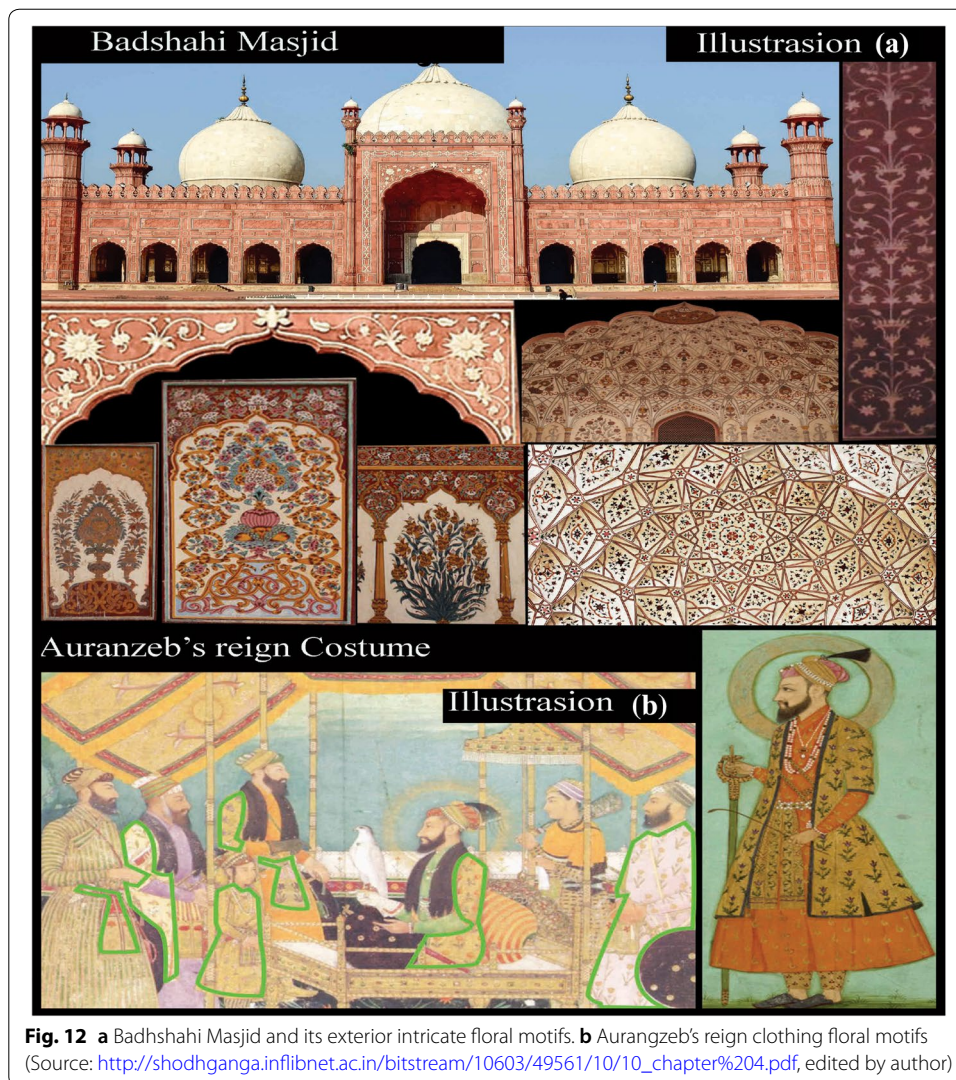


Fig. 12 **a** Badshahi Masjid and its exterior intricate floral motifs. **b** Aurangzeb's reign clothing floral motifs (Source: http://shodhganga.inflibnet.ac.in/bitstream/10603/49561/10/10_chapter%204.pdf, edited by author)

designer while presenting the fashion collection on ramp or else one can relate it while seeing. But the current research is historic in nature, so observational analysis and narrative explanations and supported literature for costumes of Mughal era was the only tool to carry out the study of relationship between silhouettes and shape of architecture at that time and past researches in this connection supported the data analysis methodology. So this section further demonstrates the interrelationship using figurative demonstrations, contextual interpretations, etc. between the disciplines.

The silhouette of an outfit is in part defined by the human body; the head, the trunk, the four limbs and their articulations; each part has a different shape and must have freedom of movement. In fashion, silhouettes are very important; they are often what is best remembered and most commented upon in collection (Atkinson 2012). Silhouette is known as outline of the garment. It determines the overall flow of fabric over human figure.

Indian Mughal Era initiated with first Babur and then Humayu's rule, both followed Mongal and Persian style of clothing in their court. Their descendant, Akbar, introduced

some changes in after ruling for four decades. He took inspiration from Indian styled clothing and introduced a costume having the coat, the turban and the trousers; were in trend at the end of sixteenth century. Over a full-sleeved undergarment was worn the half sleeved long coat with three hanging V-shaped points in front and three at the back (Kumar 1999). The coat commonly known as “Jama” was fitted tightly up to the waist and then like a skirt reached below the knees mentioned in Fig. 13b. The Mughal women’s wear includes “Ghagra” with beneath trousers and Royal ladies adopted ‘Jama’ itself similar to male as illustrated in Fig. 13c. In ladies “Jama” as well oval cut designs (Biswas 2003).

The outer structural analysis of Humayu’s tomb gives an impression that the central dome structure is surrounded by recesses at its base. The mausoleum is composed of four discrete octagonal units separated by four recesses, one of which, in the centre of southern facade. From the outside the monument appears as a large sequence of flat surfaces punctuated by recesses of varying size organized around a central dome (Grabar 1987). The close analysis of dresses which were in trend at that time was ‘Chakdar Jama’, that seems to be inspired from the outer structure of Humayu’s tomb. The resemblance in both the discipline observed in terms of mausoleum’s outer structure; which

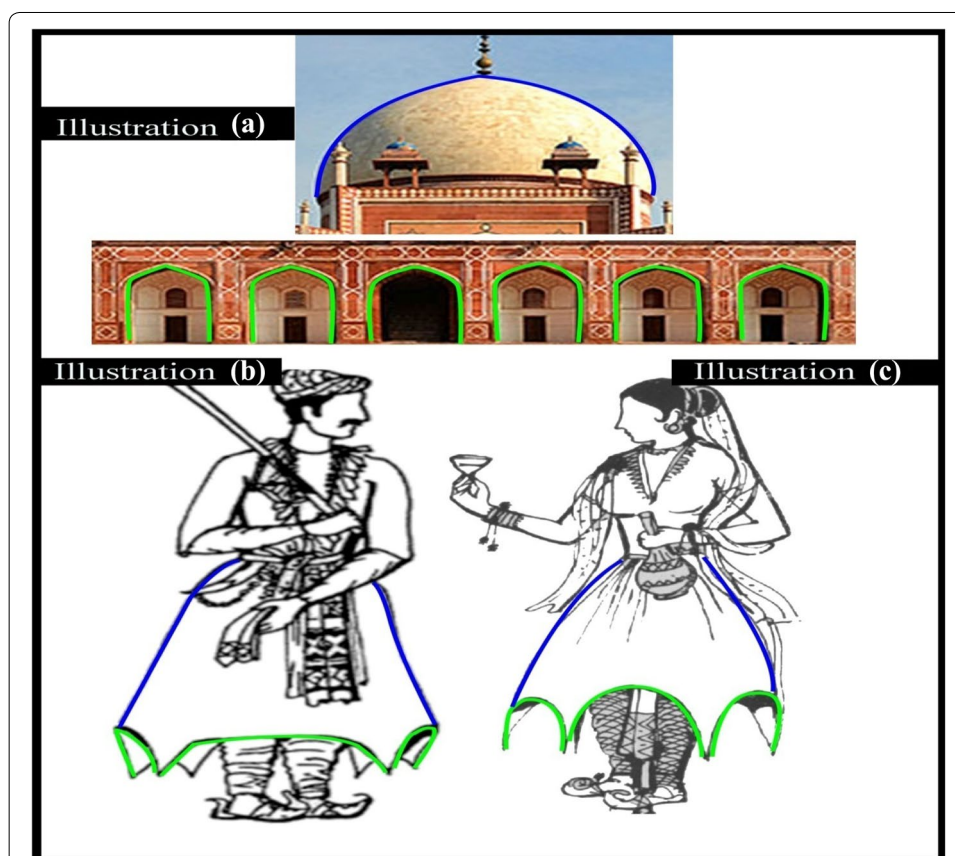


Fig. 13 a Humayu's tomb resemblance with clothing silhouettes of end of sixteenth century. b Men's clothing from Akbar's reign up to end of sixteenth century and interconnection of bottom part of jama with recesses in Humayu's tomb. c Women's clothing from Akbar's reign up to end of sixteenth century and interconnection of bottom part of jama with recesses in Humayu's tomb (Source: Biswas (2003). *Indian Costumes (Chapter IV)*. Publications Division: India, edited by author)

is surrounded by recesses base with inverted 'V' shaped openings; in connection with 'Chakdar Jama' pointed slits at its hem portion and illustrated in Fig. 13 with highlighted section.

Researcher also observed that a portion of clothing trends; 'Chakdar Jama' probably got inspiration from the monument. As construction of monument began in 1565, nine years after Humayu's death, and completed in 1572 AD (Mishra and Misra 2003). Hence, these observations directing that within same time frame, the characteristic structure of architecture and clothing silhouettes shared resemblance. Later in case of TajMahal, Badshahi Masjid also shared similar relationship between architecture and clothing silhouettes.

The regular costume of Mughal era was of bell shaped Jama with Pyjama for lower torso and Patka was tied at waist to separate upper and lower torso of the figure were renowned; as exhibited in Fig. 13. Akbar did fusion of Indian and Persian clothing styles in Mughal court by analyzing the unsuitability of religious Turkish or Mongol-styled clothing in accordance with the need of sub-tropical Indian conditions (Kumar, 1999). Akbar only introduced "Chakdar Jama" to his court and restyled it in unlined cross-over tunic, with slits around the skirt and an asymmetrical hemline restyled and developed it into a formal gown by removing the slits, rounding the hemline and increasing fullness of skirt. This version of Jama was adopted by subsequent Mughal emperors at the courts of Agra and Delhi and remained official costumes in courts in country until the late nineteenth century (Kumar 1999). So, this explanation identifies that there were very minute changes in silhouettes of costumes in Mughal era. It's also figured out that whole Mughal Era used to wear such silhouette type with minute alterations. Likewise Engy illustrated that the architectural form and design of Muslim buildings are usually influenced by one dominant style i.e. 'Dome' structure from one country or region, variation in forms and styles can be attributed to nature impacts (local materials and environment), followed by man-made impacts (Muslim immigrants, colonialism, funding, and laws, culture, and traditions) (Farrag 2017). Hence, it is rational to study on selected Mughal costume and domed architectural structures with minarets (pillars). For that reason, to represent resemblance in both forms; as demonstrate in Fig. 14 illustration (a); a dome-shaped architecture and "Bell- shaped" garment follows similar shape patterns, in addition, V-shaped opening for "Jama" as neckline and the entrances of the monuments clearly proceed to show the link between the two disciplines. Another observation follows the covering of circular roof on pillar and in similar fashion of overlapping of circular Jama over Pyjama directed to the anonymous relationship in the dress wearing habits and structural alignment; which represented in Fig. 14 illustration (b). There were no impressive changes observed in silhouette type except variations in Jama's fullness at bottom and imparted elegance and luxury in clothing in Aurangzeb and in Shah Jhan's reigns, respectively. Alike patterns were observed in architectural monuments; became more lavish and patterned with similar domed, minaret structure (Biswas 2003).

Both costume and construction are providing shelter, protection, social status, mobility to the human beings one with next to skin that states second skin and another one considered as "third skin" by providing space. As clothing is termed as second skin and shelter considered as third skin to the human body—both are playing major role for providing comfort to the body; specifically thermal comfort. Thermal comfort in

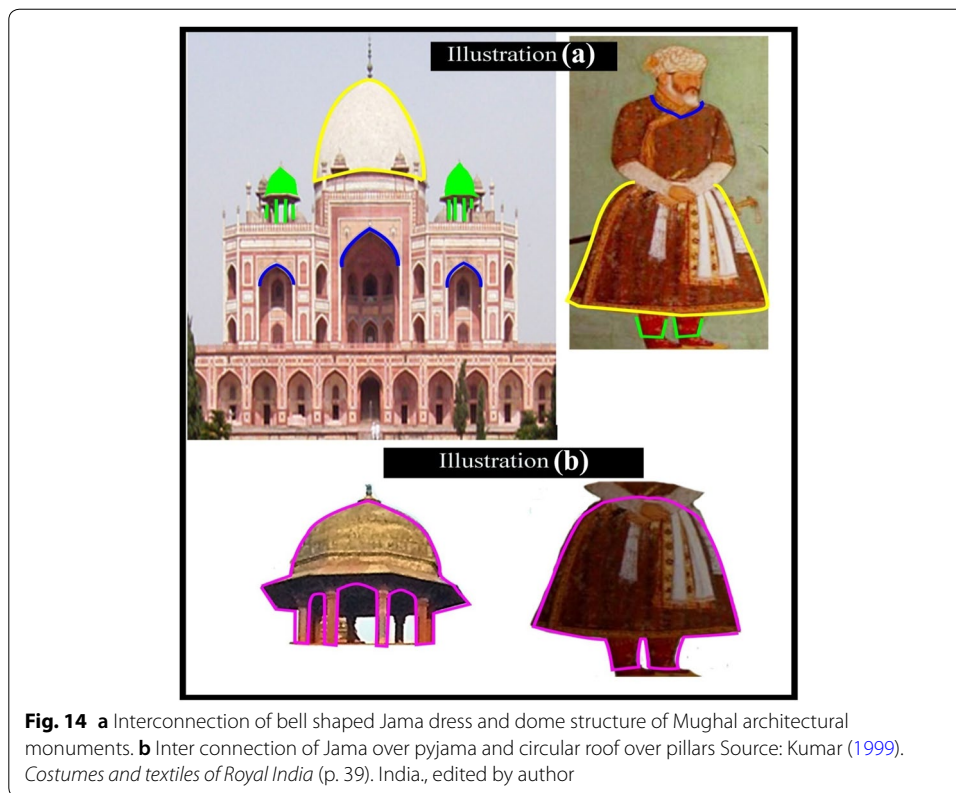


Fig. 14 **a** Interconnection of bell shaped Jama dress and dome structure of Mughal architectural monuments. **b** Inter connection of Jama over pyjama and circular roof over pillars Source: Kumar (1999). *Costumes and textiles of Royal India* (p. 39). India., edited by author

architecture refers to inside air temperature and radiant temperature (mean of all surfaces temperatures); which should be appropriate for our body metabolism. To maintain body temperature normal and to feel comfortable in different seasons, various architectural shapes have been used to maintain radiant temperature (Ali 2013). In previous sections, it's mentioned that Mughal period architectural shapes contained dome shaped structures almost each of their monuments. These were prominently used due their heat dissipation capacity in sub-tropical regions. Flat roofs get more radiations while vaulted and domed roofs prevent the absorption of heat of the summer's vertical sun. Arched ceilings have more space above the inhabitants for warm air to accumulate and finally it transmits the heat to the cool internal surfaces of the roof. Vaulted and domical roofs due to its larger surface area transmit the heat slowly to the interior spaces (Ali 2013).

Clothing comfort for modern era is an essential aspect; and many researchers made many revolutions in this field. But, this part of the study analyzes the Mughal period clothing showed in Fig. 15 along with its clothing comfort aspect with connection of architecture. The silhouette of Jama was interpreted that; it usually fitted at upper torso and with the help of Patka tied at the waist and rest will flow over the legs and its hem-line restricted slightly below the knee and not touching the ankle (Fig. 15 demonstrates the same). The flow nature of the Jama will provide better movement to legs, more surface area and length will allow improved air permeability and provide coverage to the body according to religion requirements as illustrated in Fig. 15. Air permeability of fabric characterised by fibre type, fabric thickness, pore size with in fabric and different other yarn parameters (Stevens and Fuller 2015). So to compensate it; In Mughal era

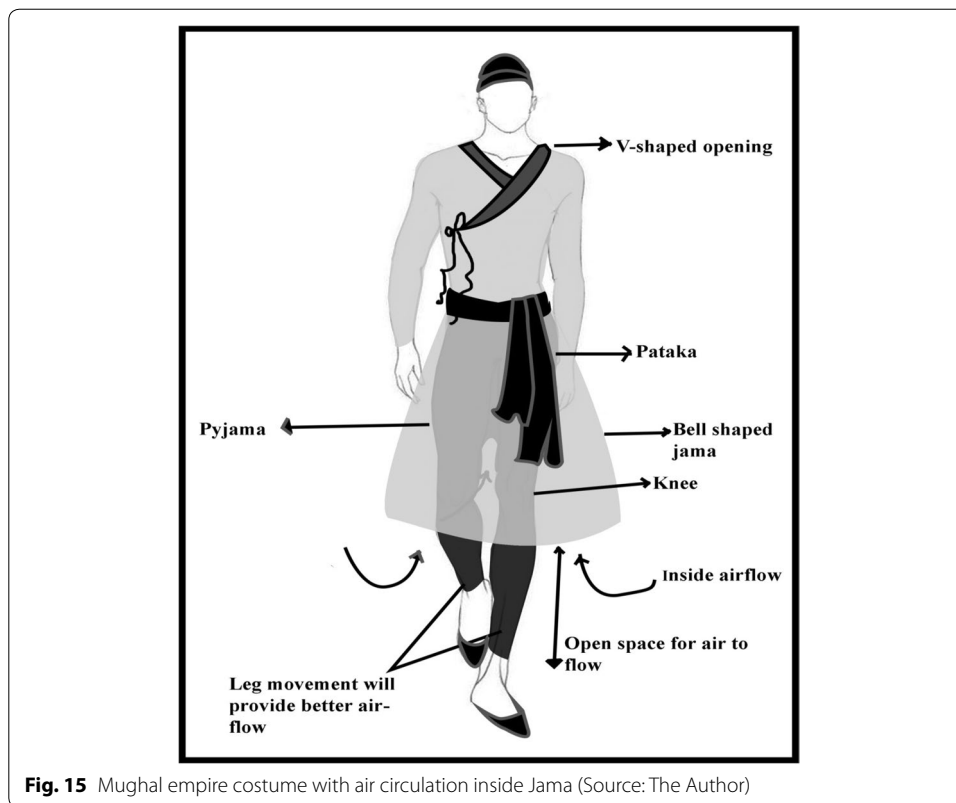


Fig. 15 Mughal empire costume with air circulation inside Jama (Source: The Author)

also, thick fabric was replaced with Indian light weight textiles in Emperor Akbar's reign to survive in Indian sub-tropical climatic conditions (Kumar 1999). For this instance, comparison of comfort aspect in these two disciplines deduces that the type of silhouette chosen at that time and corresponding dome architecture served similar purpose. In addition, Houghteling studied about the sensory qualities; which allowed Mughal to survive in Indian tropical conditions includes softness, saturation of colour and coolness on skin of cotton and velvety wool fabrics used for Mughal dresses by analyzing their weaving, embroidery embellishment techniques and declared the rich heritage of Mughal; which further also can be used for modern fashion (Houghteling 2015). The old heritage has its own importance in redefining the modern fashion and it can be done by collecting the archive data, analysis of collected data in a light of current fast fashion by redistribution of volumes, picking some colour and further create colour palette out of it, usage of specific design detail, surface ornamental technique either directly from Mughal attire or monuments for current study as relationship establish. Therefore, the observation further can be utilized by designers in a way that, monument's structure can be taken as prototype for garment silhouette and in similar fashion corresponding space, fit, motif placements, fabric colour, in some extent fabric type also can be decided.

Conclusions and implications

The main purpose of the research was to find out the interrelationship between 'Fashion' and 'Architecture' in the context to motifs used and silhouettes of Indian Mughal costumes with the Architectural monuments built between sixteenth and seventeenth

centuries. The purpose was served using interpretive research design, ethnographic observations and figurative demonstrations. The findings supported the argument and relationship was found in terms of geometrical motifs present on textiles and Humayun's tomb and Buland Darwaja built in Akbar's reign, botanical motifs usage in Jahangir's reign on costumes and monuments erected like Itimad-ud-Daula's tomb, intricate symmetrical motifs on remarkable monument 'The Taj Mahal' and on clothing flourished during Emperor Shah Jahan's rule and Aurangzeb's reign Badhshahi Masjid also followed similar pattern imitations for embellishment of both costumes and the walls of architectural monuments. After analysis of selected popular Mughal's monuments constructed in respective reigns; it was found that the 'Dome' structure was common for all monuments; which was further analyzed in the context to climatic disparity in sub-tropical conditions of North Indian region. Architecture was considered as the most influential base for creation of silhouettes for many designers. Although the past literature suggested that the inspiration only limit to aesthetic aspect, the present research unfolds the aspect of thermal comfort of clothing which can be derived from architectural shape itself.

In terms of silhouette type, researcher found interesting correlations between dome shaped structure of Mughal Architectural monuments and 'Jama' with 'Bell shaped silhouette' at the bottom and between the 'Chakdar Jama' and Humayu's mausoleum with recesses portion were popular during Akbar's reign. Dome shapes were chosen to construct in Mughal era, to displace direct heat radiations from sun to thick walled structure was able to maintain temperature difference with temperature variations in different seasons. Corresponding to Dome shapes in architecture Bell-Shaped Jama at the bottom also performed similar air circulation function for the wearer.

Leaping into the past, fusing cultures and histories, fashion is able to reconfigure the past in the light of present. Thus fashion designer, with his visionary gaze oriented to the past to previous generations, makes his own era more vivid than it is for his contemporaries (Pistilli 2018). The present study relevant to create fashion designs was not only based on aesthetics but the functional aspect as well, using architecture as an inspiration. Another horizon of research can also be projected by developing a 'Standard Relationship Model' for comparing similar structured architectural buildings and silhouette of clothing, which can provide direct information for the designer to develop silhouettes both aesthetically attractive and add on functionality. The analogy simultaneously can be implemented to motifs too. The design patterns can recreate on fabrics from architecture and to preserve the historic heritage which plays a vital role to derive modern fashion. The current research limits on Mughal Empire of India and the correlation of the two disciplines is only applicable only to selected monuments and costume types.

Authors' contributions

AK: idea generation, data collection, manuscript writing, editing figures, preparation of figure with software etc. whole tasks related to given research. The author read and approved the final manuscript.

Authors' information

Author is very keen to do research and has few credits on her name including scholarly article publications and her active participation in conferences, seminars and other research related activities during her professional stay in "Ethiopian Institute of Textiles & Fashion Technology, Bahirdar University, Ethiopia" for 3 years and got appreciated also for her analytical thinking.

Acknowledgements

Springer Nature Waiver group for waiving off whole charges for manuscript processing.

Competing interests

The author declares that she has no competing interests.

Availability of data and materials

The main material used for the research are architectural monuments which are mostly situated in various cities of India, it includes Humayun's Tomb, New Delhi, India, Buland Darwaja, Fatehpur Sikri, Uttar Pradesh, India, Taj Mahal, Itimad-ud-Daula's tomb in Agra, Uttar Pradesh, India, Badshahi Masjid Lahore, Pakistan. Data, documentary literature supporting to research are available in Mughal era museums, historical books, journal articles etc. mentioned in reference list.

Funding

It is declared that there is no funding applicable for given article.

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Received: 16 October 2018 Accepted: 5 February 2019

Published online: 12 June 2019

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