Chapter 2

Literature Review

2.1 Introduction

This chapter discusses a research strategy that followed to review related literature. The researcher has followed 'Systematic Literature Review' method suggested by Transfield et al. (Transfield, Denyer, & Smart, 2003).

A thorough review of literature is undertaken. It is conducted with reference to existing related literature through journals, books, magazines, and online sources. The 'Systematic Literature Review' method has guided the researcher to develop a research model based on the theoretical framework and identifying building blocks for the research. Building blocks further fragmented into constructs and variables for the study. ‘Funnel method’ has helped in structuring and identifying key areas for the literature review.

The purpose of the literature review is to understand Indian manuscriptology in context of composition and layout design along with design concepts of modern graphic design.

Handwritten manuscripts are considered as one amongst various tangible cultural heritage of India. Since they are available in huge numbers and are preserved at various repositories across the country (Gaur R., 2011), the scope of the study has been kept limited to Maharashtra and, the script of the region was Devanagari in the seventeenth century.
2.1.1 Aim of Literature Review

- To establish theoretical framework; to identify available literature related to study of Layout and Composition of the seventeenth century Devanagari Brahmanical manuscript in Maharashtra, and to compare them with design concepts of modern graphic design
- Identify various studies carried out previously in the relevant field
- Establish the area of study
- To find out research gap

2.1.2 Research Objectives

- To identify key terms, definitions, terminology, and variables in the layout and composition of the seventeenth century Devanagari Brahmanical manuscripts
- To explore possible linkages between the seventeenth century Devanagari Brahmanical manuscripts of Maharashtra and design concepts of modern graphic design followed in India. The focus of the study is especially on ‘Publication Design’.
- To investigate the history of publication design, i.e. Book Design evolved through the seventeenth century Devanagari Brahmanical Manuscripts available in Maharashtra, and the use of ‘Fundamental Design Principles’ for visual communication.
- Influence of other cultural designs on the seventeenth century Devanagari Brahmanical manuscripts.
- To know more about the knowledge of design prior to the printing revolution, the latter began in Maharashtra in the eighteenth century.
2.1.3 Research Model for Literature Review

Table 2.1: Theoretical Framework for Literature Review & Research Work

2.2 Overview of Devanagari Script

Devanagari, a widely used script in India in large proportion among the various Indian scripts (Kumar, Committees and Commissions in India, 1947-73: 1977 (4 v.), 1975, p. 65). This script is mainly used to write Marathi, Sanskrit, Hindi, Nepali as well as more than 36 Indian languages (Bright, 1996, p. 384). Maharashtra is one of the states of India, and the language of the state is Marathi. This script is adopted to write Balbodh Devanagari (Kapoor, 2002, p. 4511; Bhagwat, 1961).
2.2.1 Origin

Many scholars in the field affirmed that like all other South Asian scripts, Devanagari is also originated and developed from Ashokan Brahmi script (Hebbar, 1988, p. 253; Naik, 1965, p. 111; Maurer, 1976, pp. 101-104) (Bright, 1996, p. 384) (Murthy R. S., 1996, p. 13).


Several studies regarding the etymology of ‘Devanagari’ revealed that the name 'Devanagari’ derived from the script belongs to the ‘City of Gods’ and the city is Patliputra i.e. Patna of today. Devanagari was also known as ‘Nagari’ earlier. In a late ninth century, the term ‘Devanagari’ came into use (Naik, 1965; Maurer, 1976; Bright, South Asian Writing Systems: The Devanagari Script, 1996, p. 384).

Kakasaheb Kelkar argues (as cited in Naik, 1965), that the Varanasi city was known as Devan-nagari, i.e. ‘City of Gods’, so the script is to honour city, i.e. ‘Devanagari’. References of ‘Nagari’ are found in the Setu-Bandhan of Bhaskaranand and ‘Vatulgama’ (Naik, 1965, p. 113).

According to Pt. Gaurishankar Oza, a script similar to today’s Devanagari existed in south India since the eighth century AD, i.e. much before it is seen in north India. From the eleventh century onwards, some elements of the Nagari script and the Kutil script combined to develop a new script. The element such as shirorekha is developed from this combination. The width of Shirorekha is generally equivalent to the width of akshara. As a result letterforms are transformed as today’s Devanagari in the twelfth century (Ojha, 1977, p. 54).

Wujastyk thinks that ‘Siddhamatṛka’ is the ancestor of Devanagari script (Wujastyk, 2014, pp. 159-182).

According to Murthy, Devanagari script was fully developed by the 10th -11th centuries AD. It was originally called as ‘Nagari-lipi’. Currently, the script is known to Maharashtra as ‘Balabodha’ (Murthy R. S., 1996, pp. 13,14)
B. S. Naik stated in his ‘Typography of Devanagari’ that the development of Nagari letters is noticeable from the eighth century. The use of Nagari characters are found in a grant-deed of Rashtrakuta king Dantidurga (AD 754) in South India; in a grant-deed of Rashtrakuta ruler Govind (794 AD) found in Paithan and in a grant-deed of Mahendrapal (AD 955) (Naik, 1965, p. 113).

2.2.2 Systematic and Linguistic Features of Devanagari Script

Devanagari script is composed of thirty-four consonants and fourteen vowels. In addition, there are two vowels and two consonant-compounds (Naik, 1965, p. 175).

Characteristics of Devanagari script are: it is phonological script; written from left to right; typologically it is called ‘alphasyllabary’ because each unit consists of consonant and vowel known as ‘askshara’; vowel symbol functions as diacritic (Bright, South Asian Writing Systems: The Devanagari Script, 1996, p. 384; Gokhale, Devanagari Lipi: Chinhanchi Shastriya Olakh Ani Arekhan Paribhasha, 2008).

This Indic writing style is known as ‘abugidas’, means segmental writing. This writing system is based on consonant and vowel sign is secondary but essential (Bright, 1996, p. 384; Bordeau, 2010).

Bhagwat has classified critically Devanagari letters by arranging them in groups. They are formed according to size, complexity, elements, designs, etc. While comparing Devanagari with Roman script, it is observed that ascender area of Roman characters is utilized for matras, velantis, and rafars in Devanagari; and descender area of Roman script is utilized for ukars, rafars and the halant sign (Naik, 1965, p. 205).

Consonants are written below headline or Shriorekha unlike Roman script where characters are based on base line (An Introductory Manual of Devanagari Calligraphy, 2015).

Bhagwat constructed the structure of the Devanagari script, as shown below in figure 2.1. It is made up of curves, loops, hooks, circles, and straight lines. All these shapes form multifaceted angled dashes and dots. (Naik, 1965, p. 209)
2.2.3 Devanagari Calligraphy


A conventional tool used for writing Devanagari script is a reed or bamboo pen. The tip of pen has forced cut in 45 degrees. (Naik, 1965). The height of the letterform depends on the width of the nib. Cut-angle of reed pen may vary between 35 to 40 degrees to get flat writing edge (An Introductory Manual of Devanagari Calligraphy, 2015).

Joshi elucidates regarding reed pen and how it functions while writing Devanagari script. For instance, a reed pen is made from dry plant stalk, and the flat side of it has zero thickness. While drawing lines it is by changing angle of a reed pen one can get very thick line at one place and very thin line at another place (Kohei, Akara: The Art and Spirit of Indian Calligraphy; A Conversation with R.K.Joshi, 2014, p. 266).
Figure 2.3: Writing Sequence of Devanagari script with different units to form a character ‘अ’ (Gokhale, Design Parameters of Devanagari, 1983).

Devanagari script has evolved in the last so many centuries and one can easily see the change in the form. (Kohei, Akara: The Art and Spirit of Indian Calligraphy; A Conversation with R.K.Joshi, 2014, p. 274)

Figure 2.4: Minute Anatomy — Details of Devanagari Letterform, (Gokhale, Devanagari Lipi: Chinhanchi Shastriya Olakh Ani Arekhan Paribhasha, 2008, p. 47)

In 1957, the Committees and Commission in India advocated adoption of Devanagari script for writing optionally other Indian languages. Hence, the reformation of the script was suggested in bringing standardization (Kumar, Committees and Commissions in India, 1947-73: 1977 (4 v.), 1993, p. 65). The standardization of Devanagari was finalized by Education Ministry on 21st January, 1960 which helped in technical production of types (Gokhale, Devanagari Lipi: Chinhanchi Shastriya Olakh Ani Arekhan Paribhasha, 2008, p. 25) (Wakankar L. S., 1968, p. 105).
2.3 Previous Studies in Indian Manuscript Design

According to Sarkar, the objective of the study of manuscripts is to enlighten the traditional characteristic of the nation, its culture and best qualities of a human being of that era (Sarkar J., 2012, p. 121). Sarkar thinks that Indian manuscripts have a continuity and hugeness. According to him, the formal aspects of manuscripts include structural investigation of elements linked to visual and aesthetic qualities (Sarkar J., 2012, p. 116).

R.S. Shivaganesha Murthy in his ‘Introduction to Manuscriptology’, explicitly incorporated topics related to Indian Manuscripts, such as antiquity of writing in India, related references in the ancient literature, materials, instruments, process, preservation and cataloguing, critical recension etc. According to Murthy, the ancient manuscripts are the link between past and present. They are helpful for reconstruction of Indian literary tradition (Murthy R. S., 1996, p. xi).
A survey conducted by Palit shows that there are several manuscripts scattered all over India, among them 67 percent are in Sanskrit; 25 percent are in other Indian languages and 8 percent are in non-Indian languages (Palit, 2010, p. i).

2.3.1 Definition of 'Manuscript'

The National Mission of Manuscript, established under ‘Ministry of Tourism and Culture', Government of India in 2003, defined manuscript as a handwritten composition on paper, bark, cloth, metal, palm-leaf or any other material dating back at least seventy-five years. It has significant scientific, historical or aesthetic value (Indian Manuscripts: What is Manuscript, 2007).

According to Bhoi, a ‘Manuscript’ is a Latin word; manu means 'by hand' and scriptum or scribere means 'to write'. Thus, it is a material or a thing, which is handwritten (Bhoi, 2010, pp. 71-92). Palit defined it as ‘Manuscriptus', the Latin word consists of two terms 'mane' and ‘criputus’ which mean hand written (Palit, 2010, p. xix).

According to Tripathi, a literary tradition has a material basis, and it has to be studied under various disciplines such as paleography, art history, and chronology. Chandrabhal Tripathi puts together meaning of ‘Manuscriptology’ defined by modern Indian scholars as, (i) hasta-likhita-prati, (ii) hasta-prati, (iii) hasta-likhita-grantha, (iv) grantha, (v) hasta-likhita-pothi, (vi) likhita-pustaka, and (vii) pustaka. There are few traditional terms for manuscript such as ‘pothi’, which was used in Maharashtra and Gujarat. In Bengal it was called as ‘punthi’ or puthi’. In early Jain literature, it is mentioned as ‘gatha potthaga’. A term ‘Pustak’ was used in the medieval period (Bibliothèque nationale et universitaire de Strasbourg, Catalogue of the Jaina Manuscripts at Strasbourg; Volume 4 of Indologia Berolinensis, 1975, pp. 15-16).

2.3.2 Subjects handled and Types of Manuscripts

Palit found that the subjects of Indian manuscript are related to Jainism, Hinduism, science, mythology, Indian philosophy, literature and, they are written in various Indian scripts (Palit, 2010, pp. xix, xx).

Velankar in his ‘Descriptive Catalogue of Sanskrit and Prakrit Manuscripts, classified subjects dealt in manuscripts into four categories: (i) Technical Literature (Linguistic Science, Literary Science, Medicine, Astronomy and Astrology, Architecture); (ii) Hindu Literature (Veda, Vedic Dharmashashtra, Tantra, Purana, Philosophy, Kavaya, Stotra); (iii) Jaina Literature (Agama, Philosophy, Legends, Poems, Stotra) and;
(iv) Vernacular Literature (Gujarati, Hindi, Marathi and Buddhist manuscripts) (Velankar, 1998).

According to Ranade, the Buddhists copied and maintained Buddhist texts in libraries. Buddhist monks travelled and stayed in a large number Viharas in the Deccan region. The other religious sect namely the Jainas also maintained a large number of libraries or bhandaras. Progression of Bhakti movement initiated by Chakradhar Swami, Saint Jnyaneshwar, and the rise in a number of religious sects added a lot of devotional and poetic literature in the Marathi language. All Mahanubhava literature is found written on paper and copied in a large number. Ranade elaborated the list of books and excellent libraries in the monasteries established by Samartha Ramdas. This enlisted literature is found written mainly in the areas of epics, stotras, rituals, tantra, philosophy, mythology and astrology. Ramdas insisted on the significance of the art of writing (Ranade U., 1983, pp. 18-27).

The Gilgit manuscripts discovered in an old brittle Buddhist stupa in 1931 in Gilgit area in Kashmir. These are the oldest manuscript found in India. Key features of these manuscripts are, Period: 5th-6th century AD; Material: Birch bark; Language: Hybrid Sanskrit; Script: Gupta Brahmi & post-Gupta Brahmi; Subject: Buddhism, its ritual, philosophy, iconometry, folk tales, medicine and several others related to areas of life and knowledge (Jatoo, 2013-14, p. 25).

2.3.3 Medium of Writing

According to Naik, the most common material used in ancient south India to write manuscripts were Tada-patra (palm leaves); and in north India Bhurja-patra (birch bark) respectively. Though the paper came into use in China in the beginning of the second century A.D., the evidence of use paper for writing manuscripts in India are seen from the eleventh century onwards (Naik, 1965, pp. 13-18).

Murthy states, that the Palm-leaf and Birchbark were used from early times. Chinese traveller Itsing bought the paper to India during 6-7 century AD for copying manuscripts. However, it was known to Indians in Mughal reign. Paper was manufactured in Siyalkot, Kashmir, Kagazipada near Vikramsila in Bihar, Kagajpura near Daulatabad. Siyalkot paper was known for fine finish during Akbar’s’ reign (Murthy R. S., 1996, pp. 25-35).

Satyendra states that during Akbar’s reign, Siyalakot was a well-known educational center, and there were industries producing ink and paper. ‘Mansinghi Kagaz’, an
excellent quality paper from Siyalakot was very popular. The paper was also produced in Kashmir, Jaipur, Jodhpur, Sawai Madhopur, etc. during the medieval period (Satyendra, 1978, p. 83).

According to Palit, in India various mediums for writing were explored, e.g. clay tablets, stones, metals, ivory, tortoise shell, tree barks, and leaves, animal skins, and cotton and silk. Tulat paper and handmade paper were popular medium (Palit, 2010, p. xix).

2.3.4 Template Design Tools

Scribes used ‘Rekhapati’ or ‘Samasapati’ to draw parallel and straight lines on a paper. A thread woven through the holes at the edges of the plate in such a way that on the front side all threads are parallel to each other horizontally. First, some mixture is applied to the threads on their parallel side and then the impression of these lines (rules) were obtained on paper. The impression is taken by keeping paper above parallel lines on a plate and by applying pressure using finger over the thread. In the centre of two lines, again another set of the line is marked using ‘Rekhapati’. After horizontal grid lines are marked, two vertical margin lines on left and right sides are marked using red ink. Jaina monks used such type of beautiful plates for marking lines. In Rajasthan, scribes used ‘Kamba’, a thick ruler made of wood (Ojha, 1977, pp. 121-122).

![Figure 2.6: Rekhapati —-Front and back sides with woven thread and ruled lines on paper. Courtesy: Vedic Samshodhan Mandal, Pune.](image)

2.3.5 Manuscript Writing Tools and Instruments

According to Murthy, the manuscripts were written and copied but every scribe had his own peculiar style of writing. Therefore, each manuscript is found different from other.
The style of writing may vary with the use of instrument as well as it depends on a scribe of a particular school (Murthy R. S., 1996, pp. 16, 17).

Pangarkar commented and elaborated very well on the verses written on ‘art of writing’ i.e. ‘Lekhan-kriya-nirupana’ (Dasak 19, Samas 1) by the noted saint and poet Samarth Ramadas (1608-1681 AD) of Maharashtra in the seventeenth century. These are the instructions for his disciples or to scribes. Ramadas touched upon all aspects of manuscriptology i.e. materials, process, and calligraphy. He also emphasised on illustrations, painting i.e. ornamentation and decoration, aesthetics, and finally binding and preservation of a book (Ramdas, 1990, pp. 688,689).

Murthy distinguished writing instruments into three types: (i) hard or sharp tips to incise, e.g. stylus called ‘shalaka’ or ‘lohakantaka’; (ii) soft and smooth tips to write, e.g. ‘lekhani’; (iii) brush to paint. (Murthy R. S., 1996, p. 49).

Figure 2.7: New manuscript inscribed by the stylus. Tip of the stylus made of metal and its body is made of wood. Lanna manuscripts. (EFEO Bangkok Centre)

Terms used for various writing tools namely, (1) Lekhani, brush made of fibers; (2) Kalama, reed pen; (3) Tuli or Tulika, brush; (4) Varnika, pointed wooden pen; (5) Varna Vartika, colour pencil; and (6) Shalaa, round pointed tool used for engraving. Stylus used in south India to scratch on palm-leaf (Naik, 1965, p. 19) (Ojha, 1977, pp. 120-121). A compass is frequently used for making geometrical illustrations such as lotus, astrological charts, etc. A shalaka is used to draw margin lines and other horizontal and vertical lines (Ojha, 1977, p. 121). Murthy also stated that the rulers, compasses, and bow pens were used to draw lines, circles and patterns. Along with these materials, ‘Rekhapati’ or ‘Samasapati’, burnishing stone, counch for polishing and knife were used. Murthy mentioned different terms for reed pen, e.g. ‘akshara-tulika’, and for tablet or board ‘akhara-bhumika. Kachana’ is a term used for string, which was used for tying leaves of manuscript. (Murthy R. S., 1996, p. 50).
Palit observed that for writing purpose along with metal and bamboo nib, the feathers of peacock and vultures also were in use (Palit, 2010, p. xx).

Muni Shri PunyaVijayji listed basic material and writing equipments and other instruments utilized in making a book in ancient Jaina literature namely, ‘Rajaprashriyopaga-sutra’. These materials are: 1) patra (leaves) (2) masi (ink); (3) lekhani (pen); (4) dora (thread); (5) kashtha (kambi, supporting wooden boards); (6) chadan (covering); (7) granthi (a thread passed through the hole made in folios and a book tied with knot); (8) lipyasana (material on which text is written); (9) akshara (character); (10) shinkhala; (11) Haratal (to remove wrong text) (Punyavijay, 1938, p. 18; Satyendra, 1978, pp. 19,20; Murthy R. S., 1996, p. 24).

Figure 2.8: Ink-pots, Source: Private publication ‘Dipping into the Glorious Past’, Raja Dinkar Kelkar Museum, Pune

2.3.6 Ink

Naik states that black ink which is mentioned in ‘Grhya-Sutra’ called ‘Masi’. It was used for writing before the fourth century BC. Black ink was made of powder of charcoal mixed with gum, sugar and water. Permanent ink, made up of borax, lodhra and lamp-black was made from sesame oil. Apart from this, red colour (made from hingula); green and yellow colours were also used in manuscript writing. Gold and silver inks were used in illuminated manuscripts (Naik, 1965, p. 19).

Y.K. Bukhari described rare information in his article on ‘pigments’ collected from manuscripts ‘Asrarul Khat’ i.e. the Secret of Calligraphy’ written in 1690 A.D. during the reign of Mughal emperor Aurangzeb, now available at National Museum, New Delhi. Topics incorporated in ‘Asrarul Khat’ manuscripts are related to paper, colours and its
kinds, calligraphy, ink, preparing wasli, knife, pen and inks, gold solution, and various types of colour preparation e.g. Lamp black (siyahi), vermilion, verdigris (zanga), and two properties of lapis-lazuli (lajaward) i.e Asli -natural and Amali - artificial (Y.K.Bukhari, 1963).

2.3.7 Sizes and Forms of the Manuscripts

Manuscripts found in India are mostly oblong and square. The reason behind oblong size of palm-leaf manuscript lies in the shape of palm leaf. There could be a possibility of changing the format because of a wide range of paper sizes (Murthy R. S., 1996, pp. 36, 104).

Schuyler communicates the size of palm-leaf; which was approximately eighteen inches long and double in the middle. Then they were cut in the midrib, and out of the single leaf, two leaves for writing were made. (Montgomery Schuyler, 1908, pp. 281-283).

Muni Punyavijay referred various types of manuscripts from ‘Dashavaikalika Haribhadrikatika’. The type of manuscripts mentioned are: ‘Gandi’ – a book wider in the middle than at the end; ‘Kacchapi’ – like tortoise shape; ‘Musti’ – can be held in a fist; ‘Samputa-phalaka’ and Chepati or Chivadi or Shrapatika – thin book with few leaves; and ‘Chedapati’ – a book with very few leaves (Punyavijay, 1938, pp. 22-24).

There are other forms of stitched manuscript found in north India mentioned by Satyendra, they are Pothi, Gutka (both are centre-stitched books while Gutka size can be 6 in x 4.5 in), book like Pustika (bigger in size around 21 in x 4.5 in), Pustika ( size around 7.5 in x 5.25in), and Panavali. Potho size manuscript is thicker than Pothi. It is stitched either at the center or on the side. Panavali which is an oblong form of manuscript stitched at the shorter side is also called pothi. Patra is loose sheets type of a book (Murthy R. S., 1996, pp. 103-104; Satyendra, 1978, p. 82).

Figure 2.9: Gutka Manuscript, a small book of hymns from the Guru Granth Sahib, Dr. Gurpal Singh Bhuller collection, (SikhMuseum.com, 2013)
Murthy observed that although the manuscripts available in various sizes but the leaves of one manuscript are of uniform size as in modern book design (which is noted in all types of material used to write manuscripts e.g. palm-leaf, paper, etc.) The factors need to be considered while choosing the size of paper, they are: purpose and text content including personal liking. (Murthy R. S., 1996, p. 104).

Ranade observed that the oblong was the most popular form of the manuscript during the seventeenth century in Maharashtra. A very few experimental layouts in the vertical format are seen (Ranade P., Form and Page Turning Function of 17th century Devanagari Manuscripts of Maharashtra (India), 2015, pp. 2-12).

### 2.3.8 Schematic Structure of the Manuscripts

Sivaramkrishna highlighted traditional Indian structure for writing, using a rhetorical mode known as 'anubandha chatushtaya'. It comprises four elements, such as: adhikari, prayojana, sambadh and vishay. Adhikari means target audience; prayojana is the purpose of writing; sambandh is a relationship of the subject with other subjects; and vishay is the theme or object of knowledge. (Sivaramkrishna, 1998, pp. 7-13)

Bhoi explained a subject matter of Odisha manuscripts, that are usually divided into four parts: (i) mangalacharan i.e. to honor god or goddess; (ii) the main body of manuscript; (iii) conclusion or end; (iv) and pushpika or a colophon (Bhoi, 2010). Colophon reveals many aspects of the manuscript e.g. scribe, owner, author, subject, deity, beliefs, family, dynasty, cultural perspectives, historical information, place where it is written, date, etc. (Unpublished Ph.D. Thesis, Use of Palm leaf Manuscripts as a Historical Source: An Ethno-Historic Study with Reference to Orissa, p. 12).

Nandi and Palit describe various parts of manuscripts other than main body text, they are: blionita or preamble which reveals the name of manuscripts and pushpika or colophon. The latter is generally found on the first or the last folio, speaks briefly about autobiography of the writer, the name of the manuscript, the date of text, the name of the scribe, etc. (Palit, 2010, p. xx).
Rana thinks, there are three types of colophon (upasamhara / pushpika) that appear at the end of the chapter. Colophon contains detailed description of the author and the scribe, and date of composition. Their types are: inter-text colophon (end of chapter – ‘itiprathmo’dyayosamapt’), text colophon – (‘itisamaptoyamgranthah’), and post colophon – (written by scribe i.e uttarpushpika). Post colophon is very important as it states the history of the manuscript, namely the author, scribe, date of composition, purpose of writing or copying, praise of patron, writing by order of a king or a royal person, and sometimes handling and preservation of manuscript (Rana, 2006, p. 6).

According to Satyendra, ‘pushika’ or colophon comprises of the name of the author, when it was written i.e. the period with details, swasti wachan, reason, dedication, dynasty, laudation, imprecation, etc. (Satyendra, 1978, p. 48).

According to Murthy, the colophon which is added at the end of section/cantos, provides information about title of work, poet/author name, place of author, name of patron, date of completion of work, and sometimes the number of verses contained in the work; and ends with salutation (Murthy R. S., 1996, p. 107).
2.3.9 Grids and Columns

Tripathi observed that the palm-leaf manuscripts are frequently found divided into two or three columns. The continuity of the text in these manuscripts set horizontally in the same line across the columns (Bibliothèque nationale et universitaire de Strasbourg, Catalogue of the Jaina Manuscripts at Strasbourg; Volume 4 of Indologia Berolinensis, 1975, p. 24).

The most recent study conducted by Bokil is about various forms of grids and their use in the layouts. He thinks that the grid is employed in the layout as a syntactic device to prepare a framework of 2D surface. He found that in India a grid is the part of the tradition and it has been practiced in the art related to religion. Types of grids practiced, such as, (i) a grid in the form of dots to draw rangoli patterns, (ii) syntactic grid using space division to draw portraits or sculpture making, (iii) semantic modular grid used in paintings, (iv) hierarchical grid to show hierarchy among various visual elements (Bokil, 2009, pp. 42-48).

Figure 2.12: Column Grid, Astasahasrika Prajnaparamita Sutra - Indian palm leaf manuscript written in the 11th century (Hess, 2007)

Figure 2.13: Illustrations placed within Hierarchical Grid - Uttaradhyayanasutra; Kapila(Museum and the Victoria & Albert Museum', British Library and Institute of Jainology, 2006). © Victoria Albert Museum, London
2.3.10 Composition and Editorial Styles of Indian Manuscripts

Murthy has defined three types of manuscripts depending upon writer, composition, and copier. The first is an ‘autograph copy – a manuscript written by author himself or composition dictated to someone by author. The second type is ‘immediate copy’ – in this type, a copy is made from an autograph copy but not under the supervision of author. The third type is ‘transmitted text’– where the original text is copied by many in stages (Murthy R. S., 1996, pp. 112,113).

Tripathi has distinguished manuscripts of three types: (1) simple type contains only one text; (2) Bibliothèque collective type with different parts or folios collected together in case of loosing folio (repair work). It has no uniformity and; (3) composite – more or less closely related text of different manuscripts or addition in to free margin areas (marginalia) later by scribes (Bibliothèque nationale et universitaire de Strasbourg, Catalogue of the Jaina Manuscripts at Strasbourg; Volume 4 of Indologia Berolinensis, 1975, pp. 18-20).

Satyendra observed that in ancient times the words were written continuously with no space left in-between. The letters also were written independently. Clarity in linguistics and grammar guided manuscript artist in not using the space between words (Satyendra, 1978, p. 34).

Olivelle studied Kautilya’s ‘Arthashastra’—(chapter 10) in the time of Chandragupta Maurya, in which Kautilya mentioned qualities of the scribe and composition of the letter (2.10.23). According to Kautilya, the scribe in the king’s court should be aware of all rules, develop the ability to write quickly, should have beautiful handwriting, and adopt ability to read a document. Kautilya further classified ideal qualities of document, such as: sequence for any document main points should be stated in the beginning; consistency in the statements without repetition. Completeness of document means – wherever necessary scribe should add reason, citations, and illustration; document should end with a word ‘iti’ which serves as concluding word. Kautilya also referred a cluster of minimum one and maximum three words, and this collection of words makes a sentence. (Olivelle, 2013, pp. 119, 120).

Tripathi explains different layout structures of a manuscript based on the text. Whenever there is only one text, a layout has to be presented one after other. This method is suitable for reading. A few other conventional methods were used for page layouts when there is
a text (mula) and commentary. (i) In the first method, main text (mula) runs parallel to the commentary; (ii) the second method termed as ‘tripatha’ type where the page has three parallel script areas. The area in the vertical center is ‘mula’ or the main text, and the commentary is written above and below the main text; (iii) the third method is called as ‘panchapatha’ type. Page has three parallel script lines along with two vertical margin areas from left and right side; (iv) the fourth, Jaina method known as ‘sudha’ or ‘shudha’ in which ‘mula’ and commentary is written in the form of continuous chain (m-c-m-c ..).

Different colour of ink was used, for instance red to write ‘mula’ and a black to write commentary. Tripatha and Panchapatha types were introduced in 15th century of Vikram Era (Bibliothèque nationale et universitaire de Strasbourg, Catalogue of the Jaina Manuscripts at Strasbourg; Volume 4 of Indologia Berolinensis, 1975, p. 27).

Tripathi’s principle observations on the Jaina manuscripts are: (i) mangalacharana means beginning, and the text colophon means end of manuscripts; (ii) some manuscripts have main text i.e. ‘mula’ and it is accompanied by commentary i.e. ‘chhaya’; (iii) generally the foliation is done in ‘ankanlipi’ but he found ‘aksharlipi’ in addition to ‘ankanlipi’ in two palm-leaf manuscripts from northern India. He further adds that the manuscripts are found in two formats: one is phothi, which derived from the palm-leaf format with turning the edge on the top, and the other is gutaka format. The gutakas have turning edge to the left and are of small pocketsize (Bibliothèque nationale et universitaire de Strasbourg, Catalogue of the Jaina Manuscripts at Strasbourg; Volume 4 of Indologia Berolinensis, 1975, p. 18).

According to Rana, various style of writing found in Indian manuscripts. They are tripatha, caturpatha, suksmaksari and sunda (Rana, 2006, p. 6).

Satyendra describes manuscripts writing technique using the rhythmic linguistic meter. Most of the manuscripts are noticed in ‘Anushtupa’ meter, which consists of 32 characters from 4 stanzas (charna). One stanza equals 8 characters. So total number of characters are 32. Therefore, after counting the lines on every page one could know number of characters used in the manuscript.

Rajendralal Mitra (1824 – 1891), the first modern’ Indologist and librarian of ‘Asiatic Society’, studied ancient literature ‘Prashati-prakashika’ (as cited in Murthy R. S., 1996). It is an article related to letter writing composed during King Bhoja of Dhara (11th century). The article suggests folding techniques of the material for letters, leaving long space as a left margin, as well as a space in front for decoration using gold-leaf. Mitra
also cites reference of a verse in the ‘Samhita’ written by Vyasa, which refers process of how a draft of a document is to be finalized by writing on the wooden board, and finally after corrections, transferred to patra (Murthy R. S., 1996, pp. 34-35).

Tripathi noticed that for those manuscripts in which number of lines per folio remain constant, are found well executed and that too done by a single scribe. Due to negligence or change in a scribe, one can find an odd number of lines in the manuscripts (Bibliothèque nationale et universitaire de Strasbourg, Catalogue of the Jaina Manuscripts at Strasbourg; Volume 4 of Indologia Berolinensis, 1975, p. 24).

Naik and Dalvi have studied Jaina manuscript, namely 'Kalpasutra'; a few observations documented are: (i) notes found written in smaller size than the main text; (ii) balanced the composition with grey texture text and had wide margins; (iii) leading space between two successive lines is found less than the height of letter (Naik & Dalvi, 2015).

2.3.11 Design Features of Indian Manuscripts

While conducting a study of page composition of medieval Indian manuscripts, Ranade observed that Indian manuscript designers of medieval period have tried to create harmony, which includes all fundamentals of design. Space division using columns was practiced in page layouts. Design elements such as colours, contrast, proportions, along with image, text, motifs, and margins were also used. To help reader to navigate within manuscripts, page navigation system is employed in the manuscript designs. As a result
they added not only visual movement in layout but also an visual order to guide the reader to read information in particular order (Ranade M. P., 2015, pp. 37-42).

According to Satyendra, it is observed that certain trends were followed by writers/scribes/copiers of the manuscripts, they are: 1) ‘Lekhandisha’ – writing direction for Devanagari it is from left to right; (2) ‘Pankti-baddhata,’ – defined structure for lines using ‘Rekhapati’ or ‘Kambika’ (rule) and predefined size of a letter in which width and height of a letter are same; (3) Text is written continuously without spacing; 4) Punctuation marks of a single or a double danda with various other marks; 5) Page numbering — generally page numbers were given for folio, not for every page and the place for page number can be upper left or bottom right margin area; 6) 16 types of standardized marks for critical words which are difficult to read while copying; 7) Symbols for missing text or a word e.g. kakapada, (^,V.,X) or Kundala (o); 8) Abbreviations, e.g हेमन् - हे (Satyendra, 1978, pp. 33-43).

Running hand known as ‘Modi’ type of text is written for official/trade record purpose (Murthy R. S., 1996, p. 107; Joshi, Calligraphy the Art of Writing, 1984, p. 129).

2.2.12 Calligraphy

![Figure 2.15: Development of Devanagari Script](image)

Joshi listed various styles of Devanagari script, which are influenced by other Indian scripts. They are based on design aspects such as headline, vertical strokes, serifs (angular, upward short curve), thickness of scripts, forms (curvilinear, condensed, informal, etc.); The region and styles are (i) North-East influence: Pala style; (ii) South influence: Rounded style; (iii) Western Jaina: Decorative style; (iv) Western Gujarat: Folk style (Joshi, Calligraphy the Art of Writing, 1984, pp. 128,129).

Wakankar commented on Lekhapaddhati’ written by Prasad. It is a compilation of Sanskrit documents prior to Sultanate period (approx 8 / 9 Century AD) in Gujarat, (as
cited in Wakankar S. Y., 1983). The text incorporates few suggestions, on: ‘letters should be circular, compact, equal and symmetrical, well defined, that is nicely written in suitable measurements, having equal top’. Letter should be written in one straight line and it should not mix with each other. So that there should not be uncertainty in understanding or deciphering text. Consistency should be maintained in distance between letters and lines. (Wakankar S. Y., 1983). Satyendra also pointed out the ideal stanza in ‘Lipisaushthava’ which clarifies about how to write. (Satyendra, 1978, pp. 84, 85)

Figure 2.16: Elegance of Script, described in Lipisaushthava (Prasad, 2007; Satyendra, 1978, p. 85)

2.3.13 Colour, Images and Visual Hierarchy

Various colour inks were used in indigenous manuscripts, such as black, red, blue, green and yellow along with gold and silver. Green and yellow pigment mainly used in Jaina manuscripts. Many a times red ink is used for instance to paint margin borders on left and right sides; 'single danda'; ‘double danda’; ‘svarachinha’ (diacritic marks); beginning and end of chapters (colophon); to draw astrological charts, etc. In manuscripts from European red ink was used for various purpose, e.g. red glitter ink used for embellishment, for beginning letters or lines as ‘rubrics’; and hence the scribe was called ‘rubricator’. In India, these rubrics are known as ‘Surkhi’ which means red as well as the title. Gold and Silver ink were used in India as well as abroad for jobs commissioned by kings, emperors and wealthy people who could afford them (Satyendra, 1978, pp. 59,60).

Ranade has pointed out that the designers of medieval Indian manuscripts were insightful about colour, shape, and size proportion. They have employed colour sensibly for punctuation marks, e.g. to show the end of sentence or verse; red colour was used for ‘danda’. A colour palate with limited number of colours were selected to design medieval Indian manuscripts. They also preferred colour variations using the densities of ink and type size that helped in creating a contrast between main text and marginalia text.
This generated visual hierarchy that guided a reader for preferential order of information. This contrast in the density of ink and different text sizes achieved momentum and rhythm in designing the layout. (Ranade M. P., 2015, p. 41).

A study of medieval Jaina manuscript done by Ranade using ‘Eye Movement Tracking Technology’ showed that the illustrated images in the manuscript design served the purpose of a focal point. Thus, ‘Emphasis’ element of principles of design has employed to create visual hierarchy. Because of contemplative use of colours in the images, the readers revisited the image area and spent more time in viewing the image. This showed that the colours used in image area were attracting the attention of a reader than their size or any other details. This resulted in producing engaging effect in the image area and ultimately readers had to pay more attention to understand the image (Ranade M. P., 2015, p. 41).

Figure 2.17: Geeta Govinda, Early Bengali language, 18th century (Museumsofindia)

Palit has noticed that in the Middle Ages the scribes mainly used black ink for writing. For titles red ink was used, and gold and silver were used for making manuscript exclusive (Palit, 2010, p. xx).

The ‘Kalpasutra’, in the collection of Shri. Kalyanmal Dhaddha of Ajmer, the first page of the text is found written with gold ink. According to Oza it is written in the seventeenth century (Ojha, 1977, p. 121).

Gough has studied Jaina mantras, mandalas, and their use of specific colours. Gough has further observed that in 'Rishibhamandala', a tantric diagram of 24 tirthankaras, each image of tirthankaras is portrayed with different colour along with their iconographical distinguishing markers. The roots of this contemporary colour scheme are found in Prakrit text Āvassayanijjutti (Skt. Āvaśyakaniryukti)(Gough, 2012, pp. 1-47).
According to Tripathi, colour inks were used by the scribes for a variety of purpose. For example, black ink was used for writing normal text; red ink was used for folio numbers, *dandas*, figures, marginal titles or for writing 'mula' to differentiate it from commentary; whereas yellow (*hartal*) and white (*safedo*) were used for painting incorrect words (Bibliothèque nationale et universitaire de Strasbourg, Catalogue of the Jaina Manuscripts at Strasbourg, 1975).

### 2.3.14 Illustrations, Illumination and Decorative Patterns

![Islamic Manuscripts with Decorative Patterns on Borders](https://example.com/image)

Figure 2.18: Islamic Manuscripts with Decorative Patterns on Borders, (Islamic Manuscript Network)

Ranade has observed that the introduction of paper ushered a revolution in the art of bookmaking. The manuscripts written in the thirteenth century are very plain and without any illumination. The scribes of Deccan region were aware of the great art of illustration and the art of manuscript illumination was happening in the adjacent state Gujarat. Just because of rigid attitude of scribes, books designed were very plain and simple. In the later period, the dynasties from Ahmednagar and Bijapur played an important role in the importing manuscript writing and copying skill from Persia. Persian styles of decoration incorporated in the illustrating manuscript were different from those of contemporary indigenous manuscript. The characteristics of Persian manuscripts are: (i) the vertical format, (ii) small size illustrations either placed on the side of the page, (iii) profuse use of gold and ultramarine in text, (iv) delicate scroll, and (v) highly decorated title page.
The influence of Persian illumination and decoration style are noticeable in northern India. In the Deccan area Sultanate followed indigenous tradition; mainly horizontal book format without any frame around text. There is no evidence that shows the influence of Persian illustrative manuscript on the manuscripts of Deccan. In the sixteenth and seventeenth centuries, very little illumination or decoration is seen in manuscripts of Deccan. The scribes did not pay much attention in the beautification of manuscripts (Ranade U., 1983, pp. 24-27).

Murthy pointed out that a book illumination is not found before Akbar’s reign; however, the mathematics and astronomy related texts often have related diagrams (Murthy R. S., 1996, p. 108).

Satyendra observed that during medieval period books are found illuminated for the purpose of embellishments with various designs, such as birds, animals, geometric patterns, scrolls, flowers, etc. These elements were added to enhance aesthetic value but they were not necessary always related to the content (Satyendra, 1978, p. 85).

For holding leaves of Tada-patra manuscript together, the scribes used to make a hole in every page to put a string across. In case of paper manuscript writing, the Jaina scribes imitated the structure of Tada-patra. For instance, on every page they left blank space, which was meant for hole and string. They decorated this space with a filled circle or four-sided well or some other ornamentation (Ojha, 1977, p. 112).
In some manuscripts, e.g. Dhaval type from Orissa, the margins are found decorated with patterns (Murthy R. S., 1996, p. 108).

Palit has observed that the Indian manuscripts comprise mainly text and illustrations. The subjects of illustrations are related to mathematical calculations, maps, and clarifying figures. Border decoration, illuminated pictures, visually engaging initials, and decorated binding are found in illuminated manuscripts (Palit, 2010, p. xx).

2.3.15 Page Numbering

Murthy has noticed that page numbers are found marked on the left side of margin and that too in the middle part of it. Folio, which includes front and backside pages of manuscript, is numbered instead of every page (Murthy R. S., 1996, p. 106).

2.3.16 Accent Marks

Narasimha Suri has studied ‘Svaramanjari’, an ancient Indian literature. The text, according to him, emphasizes the importance of accents i.e. ‘Svara Mahatmya’. The text reveals mainly two types of accents: (i) Udatta – high accents (acute); (ii) Anudatta – low accent (grave). It is observed that various samhitas follow different styles of marking for these accents, e.g. Udatta is marked with a superscript bar in the Maitrayani Samhita and the Kathaka Samhita. Samaveda it has a vertical superscript bar (cited by Sathaye, 2015 pp 2-5).
2.3.17 Abbreviations

Abbreviations were found used in the manuscript pages very frequently in India since the period of Kushanas and Andhra (Satavahan) e.g. ‘हे.’ for ‘हेम’ and ‘िद.’ for ‘िदवस’ in the beginning of Christian era (Satyendra, 1978, pp. 41,117; Murthy R. S., 1996, p. 107)

2.3.18 Marginalia

Anything written in the margin area called ‘marginalia’. Murthy observed that marginalia was used for writing page/folio number, titles of sections/chapters/cantos, corrections as well as meanings/explanations (Murthy R. S., 1996, p. 110).

2.3.19 Segmentation / Section/ Separation / Punctuation Marks

According to Murthy, a manuscript begins with a salutation to Ganesha and/or the favourite deity or a guru of scribe, e.g. Sri-Ganeshay-namah, followed by a title of the work and a title is written in the left margin. Similarly the sectional headings are placed on the left margin (Murthy R. S., 1996, p. 105).

The study of Olivelle on Kautilya’s ‘Arthashastra’ revealed that Kautilya referred a cluster of minimum one and maximum three words, and this collection of words makes a sentence. The writing system in ancient Indian manuscripts and inscriptions, there was no space left between the words and letters; they run throughout the line without spaces. The introduction of ‘varga’ that worked as a white space is noticeable in modern times (Olivelle, 2013, pp. 119-120).

Murthy has given an example of a graphical representation of a section beginning and ending in the epic ‘Ramayana’ where a sign ‘’ is found used in the left margin where a ‘sarga’ or canto begins or ends. The similar sign is used in Bakshali manuscript to show the end of the stanza (Murthy R. S., 1996, p. 105).
According to Murthy, in Sanskrit manuscripts only two types of vertical stroke-like punctuation marks are seen; they are single *danda*’l’ and double *danda* ‘॥’. These *dandas* have a different meaning for variety of literature. In a text without metrical structure, i.e. prose passage in which ‘single *danda*’ means the end of sentence and a ‘double *danda*’ indicates the end of section or canto. In a text with metrical structure i.e. versified passage a ‘single *danda*’ means the end of first half of stanza and a ‘double *danda*’ is used for variety of purpose, e.g. denoting the end of the section or showing a number of stanzas ‘॥०॥’. In some cases, a serial number of stanzas, end of chapter/section are put in between two *dandas*, e.g. ॥५॥२॥. Here the first number reveals the order of stanza number and the second number denotes the order of a section (Murthy R. S., 1996, pp. 106,107).

According to Tripathi, the graphic marks such as ‘*cha* - च’, ‘*Shri*- श्री’, rosette and sometimes space is found used between texts as a separator mark. Apart from these various graphic marks or elements were also used to denote section separators (Bibliothèque nationale et universitaire de Strasbourg, Catalogue of the Jaina Manuscripts at Strasbourg; Volume 4 of Indologia Berolinensis, 1975, p. 18)

### 2.3.20 Binding Types and Techniques

Banabhata in his ‘*Harshacharita*’ (Bana, *Harshacharita*, p.85f, as cited in Murthy, 1997) explained how to read or handle a manuscript. For instance, just before the reading a manuscript one should untie thread around it. A low stool preferably made up of cane (*Sharashashoullaka-yantra*) should be used to keep the book on it. A bookmark is made up of a leaf and a lesser in length than a book (*antaram patram*) should be used. A few leaves can be taken in hand while reading (Murthy R. S., 1996, p. 104).

In palm-leaf and birch-bark manuscripts a cord is passed through the holes made to prevent slipping away or shuffling of leaves (Murthy R. S., 1996, p. 103).

Tripathi pointed out on an orderly arrangement of palm-leaf folios and holes for tying pages. It is found that one or two holes at equal distance pierced in the folios. If there is single hole then it was pierced in the center of the folio. In case of paper manuscripts, the holes were needless because of their fragile quality. However, the holes were continued to be part of paper manuscripts for some time and later on this practice was discontinued. The free space sometimes found encircled with decorative motifs as shown below in
Figure 2.20 or is left empty. The tradition of keeping free space was practiced by the Jainas for relatively a long period but was rarely found and used in Brahmanical manuscripts. Because of free space left for piercing area in between the text, concern arouse in continuity of the line and interruption in reading continuity, whereas lines of text are continuous above and below piercing area. Problem is more evident in some cases where width of the manuscript is very narrow and presence of the empty space for hole, the text is divided into two columns (Bibliothèque nationale et universitaire de Strasbourg, Catalogue of the Jaina Manuscripts at Strasbourg; Volume 4 of Indologia Berolinensis, 1975, p. 25)

Palit described various forms of manuscripts, such as scrolls, book form, and codex. For outer cover or binding wooden plates made of birch or teaks are placed. Exclusive covers were made of ivory or brass, and they are found decorated with carvings, precious stones, etc. (Palit, 2010, p. xx).

2.3.21 Scribe and Scribal Errors

According to Murthy, to be a scribe is a strenuous profession who does copying of manuscript and documents correctly. Generally, scribes have declared their names along with other details in the colophon. Copyist need not compose the work. Murthy relates the work of the scribe with a modern typist or typesetter who uses a typewriter or a modern printing press. A scribe called as a compositor who composes text from author’s work. In modern days after composing a text, a proof-check is done, and a text is corrected with the help of proofreader. In contrast, the manuscript writing was not the work of revision, so the could not be rectified (Murthy R. S., 1996, pp. 110,111).

Murthy and several other scholars have noticed that style of handwriting changes from person to person. This may cause visual and psychological errors while reading the copying original. According to them, a scribe’s physical and mental qualities include vigilant eyes, mental calmness and ability to sit continuously for a long period. Manuscript writing is a manual reproduction of a book and it depends upon the trust worthiness of a scribe. Scribal errors can occur because of the unfamiliarity of the script to be copied. Scribes have made different types of remarks such as ‘kundala’ – circle around letters, shows their inability to read character, whereas some left blank spaces. Those scribes who have left blank space considered to be honest (Murthy R. S., 1996, pp. 111,112).
According to Murthy, there are various types of corrections were found made in the manuscripts. Corrections are marked using various methods such as dot or small horizontal line put above in the place of the missed character. These insertion areas are marked with ‘\textit{hansapada}’ or ‘\textit{kakapada}’ using ‘x’ / ‘=’ / ‘\wedge’ and a letter is added above the line. Replacement of a letter correction is written in the left or right margin area adjacent to the line or sometimes it is placed in the top or bottom margin. Yellow pigment or turmeric is painted over incorrect portion of the text (Murthy R. S., 1996, p. 109).

2.4 Overview of Manuscript Design Trends in Other Countries

While expressing a thought about manuscripts as graphic design process, Meggs and Purvis has observed that this thousand-yearlong process of manuscript designing helped in shaping rich vocabulary of graphic forms, page layouts, illustrations and lettering styles and techniques (Meggs & Purvis, Illuminated Manuscripts, 2012, p. 47).

Process of manuscript writing in England involved preparation of parchment, cutting it into size, ruling sheet with guidelines for writing a text, text writing and paining the illustrations, collected all pages together and sew them in groups, and finally binding a book between wooden boards with leather cover (Ross, 2003, p. 53).

Rose listed material used in medieval manuscript writing such as pens or quills made from bird feathers, brushes made up of animal hair, inks and paints. Gold and Silver paints were used to enhance visual aspect of manuscripts (Ross, 2003, p. 52).

Meggs and Purvis stated that in 700 BCE Charlemagne were encouraged to revive learning and arts in England. In a \textit{turba scriptorium} (crowd of scribes) page layout, styles of writing and decoration have been reformed to prepare master copies of religious books. Later on all scribes dispersed entire Europe to spread reforms (Meggs & Purvis, Illuminated Manuscripts, 2012, p. 50).

2.4.1 Types of manuscripts

Rose observed that during medieval period religious establishments produced most of the manuscripts. The manuscripts were produced for different purpose: Antiphonals – which contains music and words sung as a daily service in churches; Benedictional – containing blessings and prayers recited by bishops; Breviaries – daily prayers recited in ministries; Choir Books – with music and songs; Homiliaries – lessons and discussions
and scriptures; Lectionaries – selected reading; Missals – text necessary for mass; Pontifical – used by popes and bishops; Sacramentaries – containing prayers recited by the priests during mass. Along with this religious text, the manuscripts on medicine and books on animals were also produced (Ross, 2003, p. 54).

2.4.2 Layout and Composition – Grid, Structure and Form

Meggs and Purvis have observed that the form and shape of most of the manuscript were such that they could fit in the saddlebag considering its portability. This has helped in spreading knowledge from one place to other through centuries. The colophon added mostly at the end of manuscript, which usually had details and facts about manuscript (Meggs & Purvis, Illuminated Manuscripts, 2012, p. 47).

In the catalogue of French vernacular literature ‘Chretien de Troyes’ of late twelfth century through the third quarter of thirteenth century observations revealed that early thirteenth century manuscripts are mostly in small format, un-illustrated and contains single story. Whereas, in the second quarter of the thirteenth century, manuscripts have larger formats and contains collections of stories. Illustrated manuscripts are seen by middle of the thirteenth century. In French manuscripts the ruling on page done by lead or crayon, which leaves faint, marks of line on paper. Crayon leaves light brownish marks whereas lead leaves dark, thick line marking on paper. First line is written above the ruled line. (Ruling used as a baseline grid) (Busby, Nixon, Stones, & Walters, 1993, p. 5)

Haslam has illustrated Villard de Honnecourt’s (c. 1225- c.1250) geometrical method of dividing space, which is different from Fibonacci scale. In this method page has 81 units; height divided in 9 units and width divided in 9 units. Units are used to define margins on the page.

Following is the systematic representation of thirteenth century Villard de Honnercourt’s Grid.

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**Step 1**

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**Step 2**

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**Step 3**

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2.4.3 Design Features

Rose found that though all English manuscripts were handwritten but all manuscripts devoid of decoration and illustrations. Manuscripts made for various categories of people; they were monks; students; royal members; and wealthy people (Ross, Artists of the Middle Ages, 2003, p. 54).

Meggs and Purvis discussed the peculiarity of Islamic manuscripts i.e. complex, decorative multiple frames around text and illustrations. These borders made up of arabesque floral and geometric repetitive patterns. In exclusive Islamic manuscripts,
space between the line i.e. negative areas filled with gold colour to make it concrete forms (Meggs & Purvis, Illuminated Manuscripts, 2012, p. 61).

According to Meggs and Purvis handwritten, illustrated and decorated manuscripts are called illuminated manuscripts because of the dazzling effect of gold-leaf technology to decorate them. They were produced in Europe until 1450 in the later period a printing revolution began and the typography evolved. Extra care and design sensitivity were the main features of these illuminated manuscripts. These books were visually embellished with patterns in gold and silver for design effects. Books had leather covers and bound between wooden boards. Scribes trained in writing text in style. Illuminators and illustrators provided visual support by ornamenting the page. *Scrittori* or a scholar used to control entire process of production including page content planning. Introduction of punctuation mark for the purpose of pause, pitch change in chants, adaptation of Arabic numerals and musical notations in the 9th century are the milestone contribution in medieval graphic design (Meggs & Purvis, Illuminated Manuscripts, 2012, p. 47).

Meggs and Purvis had observed that the Egyptian manuscript designs influenced Greek and Roman manuscripts. In simple layout a technique used of inserting small crisp illustrations in text, which gives, a feel of contemporary comic book with cinematic graphic sequence (Meggs & Purvis, Illuminated Manuscripts, 2012, p. 47).

By third century, BCE the monastic Graphic artists started designing majestic manuscript design with expensive purple colour and the text in silver and gold. Letter styles had developed in the late antique period and early Christian period and continued until ninth century. The style is simple, fast in writing and easy in letterform, called *Uncial* means written between two guidelines and distance between these two guidelines was one *uncial* (Roman inch). The *Uncial* style actually invented by Greeks in early third century BCE (Meggs & Purvis, Preface, 2012, p. 48).

After eighth century new style of book design emerged in using of Celtic forms. Celtic designs are mainly 2D design form with geometric motifs with interlaces and lacertines. Features of Celtic patterns are: abstract, geometric liner patterns with weave, twist and filled space with thick visual texture. Celtic patterns were complex designs with pure and bright colours used in juxtaposition. An era of full page illustrations has began with full page ornamented frames and borders to enclose illustrations. The ornamented large initial used in the beginning of chapters along with full page decorative design i.e. carpet design. Graphic artist had then found challenging design problem with large initials,
which was resolved using graphic principle i.e. *diminuendo* means decreasing scale of graphic information. A novelty of Celtic manuscript design was the use of space between words to help reader in reading words quickly (Meggs & Purvis, Illuminated Manuscripts, 2012, pp. 47-49).

Sarkar has argued that in the beginning period of Muslim period there was resistance for plastic or pictorial art but the art of writing slip away from this pessimistic attitude (Sarkar J., 2012, p. 121).

### 2.4.4 Calligraphy

Sarkar had found fair penmanship, elegance and beautiful calligraphic writing in most of the Arabic and Persian Manuscripts. First evidence of calligraphy is found in Hebrew script. It had distinct features like square, well-proportioned, and separate letters. Later on Arabic calligraphy evolved with influence of various cultures and enriched with good qualities of beautiful writings and forms. (Sarkar J., 2012, p. 120)

Kiiniaja stated that evolution and application of calligraphic art developed in Indian subcontinent also. Writing was one of most important religious and cultural activity in Islam. As a result of iconic drawing, figures and pictures are forbidden in Islam skills of artist and scribes can be seen as in Islamic calligraphy. There are seven well-know calligraphic style: *Naskh* - with cursive characters and equal height and weight used for copying Quran; *Thulth* - one of the most decorative and aesthetically elegant form of Arabic calligraphy used in titles of books, first page of Quran, headings, inscriptions; *Nastaliq* - with fine and delicate terminal strokes; *Kufic* - with square and angular letters, *Riqa, Diwan*, and *Tugra*. Indian Islamic calligraphers introduced attractive ‘*Bahar*‘ style in 14\textsuperscript{th} century with bold variety and round strokes without sharp ends (Kiiniaja, 2010, pp. 196-202).

The art of fine writing was encouraged in the middle period and in the renaissance period in France. Many books and treatise are produced using calligraphic text (Illuminated Manuscripts, Glossaries).

Two major standardized scripts were used for writing manuscripts in Europe during c.800 to c.1500 AD. They were Carolingian Minuscule and Gothic script. (An introduction to Medieval scripts, 2016). Notebooks of 11th century AD e.g. mathematics books for education available at National Library of the Netherlands at Hague were not fancy. Some book forms are in the ratio of 1:0.7, some are narrow, some are broader with
no title page, or publisher details. Book available in church, displayed at alter, are written in very good script and ornamented, illuminated and decorated. (Kwakkel & Harris, Making the medieval book, 2016)

2.4.5 Initials

Minor initials were most commonly used as a form of decoration in the thirteenth and fourteenth centuries in French manuscripts. They were mainly set at the left edge of the text margin and were of two lines in height. The variety of colours, such as red, blue, green and yellow were used in twelfth century. In thirteenth century, red and blue colour used for minor initials in alteration for different stories or only red has been used.(Busby, Nixon, Stones, & Walters, 1993).

Ross thinks images help in understanding the subject clearly. As per old saying ‘A picture is worth a thousand words’ – any visual of animal, human being or a common object can replace different vocabulary words of many languages. Images and text are two different things but are closely related. In the medieval manuscripts, alphabets were used to show pictures/illustrations in different types of initials, mainly in historiated type initials. This elaborate decoration has given life to letterforms. It is a very creative work and close association of text and images. (Ross, Language in the Visual Arts: The Interplay of Text and Imagery, 2014, pp. 5-24)

Various types of initials, e.g. miniature, historiated initials, foliate initials, gold foliate, red and blue parted initials and minor initials were used in French Manuscripts. Use of pen flourished initials, and filigree work were also done around minor initials for decorative purpose (Busby, Nixon, Stones, & Walters, 1993).

Amount and format of the illustration varies as per the purpose of the book. Enlarged decorated initials are the characteristic of Romanesque period manuscripts. Initials are huge capital letters used as section mark or at the beginning of new chapter. Initials can be defined according to their styles such as: ‘Decorative’ – geometric and foliage designs; ‘Zoomorphic’ – composed of animal forms; ‘zoo-anthropomorphic’ – combination of animal and human form; ‘Gymnastic’ – animals and human performing acrobatic stunts; ‘Inhabited’ – people and/or animals entangled in geometric and foliage patterns; and the most important category is ‘historiated’ – enlarged letters contains pictures or scenes of the text. Historiated forms were continued in further page layouts,
they are found in Gothic manuscripts. Half page, and full-page illustrations were very common in mediaeval period (Ross, 2003, p. 53).

2.4.6 Punctuation / Segmentation / Phonetic Marks
Study by Galambos on the medieval Chinese manuscripts showed that before 20th century no punctuation mark used in Chinese writing. Galambos has defined all marks or symbol used in the manuscript such as correction marks, phonetic marks, abbreviation marks, segmentation marks, repetition marks, etc. For correcting words the technique of painting wrong character was used or practices of marking a mistake with small dot on sides. Since, there was no system of punctuation marks, Chinese scribes wrote text in ‘chunks’ in small segments  (Galambos, 2014, pp. 341-350).

Introduction of punctuation mark for the purpose of pause, pitch change in chants, adaptation of Arabic numerals and musical notations in the 9th century europen manuscripts is the mile stone contribution in medieval graphic design (Meggs & Purvis, Illuminated Manuscripts, 2012, p. 47).

Modern Arabic foliation was used for numbering pages. (Busby, Nixon, Stones, & Walters, 1993)

2.4.7 Binding
Pasteboard technique, Morocco leather used for binding books. (Busby, Nixon, Stones, & Walters, 1993).

Specimen manuscripts of c. 1500 AD, among which few are very small are available at the National Library of Sweden. They are prayer books and their sizes are smaller than iPhone so that they can be carried while travelling. For firm binding wooden boards were used to protect stack of quires. Limp binding was very much popular in medieval period. Pages in the form of bifolium and are bound together in the form of quires. Manuscript covered by leather, silk (Kwakkel, 2016).

2.5 Graphic Design and its Role in Communication Design
Meggs and Purvis pointed out that William Addison Dwiggins have coined the phrase 'Graphic Design' for his visual form for print media in structural order in 1922. The term ‘Graphic Designer’ is well accepted by design community after world war II, till then designers were known as ‘Commercial Artist’ (Meggs & Purvis, 2012, pp. VII, IX).
Paul Rand, a well-known graphic designer, has defined Graphic Design as “Visual Communication of any kind, whether persuasive or informative, from billboard to birth announcements. It should be seen as the embodiment of form and function: the integration of the beautiful and useful. In an advertisement copy, art, and typography is seen as a living entity; each element integrally related in harmony with the whole, and essential to the execution of the idea.” (Rand, 2014).

According to Golombisky and Hagen, any graphic design has form and function but it is also related to style, trends and winds of visual culture. ‘Design’ is also influenced by technology. Though the design is influenced by many factors, the function of graphic design does not change. And the function is to communicate message visually hence also known as visual communication (Golombisky & Hagen, 2010, pp. 3-6).

Table 2.2: Etymology of Graphic and Design

<table>
<thead>
<tr>
<th>Etymology</th>
<th>Source</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graphic</td>
<td>(Barnard, 2005)</td>
<td>“The word ‘graphic’ in graphic design derives from the ancient Greek word ‘graphein’, which meant ‘mark-making’ and which covers written and drawn marks”.</td>
</tr>
<tr>
<td></td>
<td>(Graphic Art Design and Graphic Design, 2009)</td>
<td>“The word derived from the Greek word ‘Graphikos’. It stands for writing, drawing, pictorial representation”.</td>
</tr>
<tr>
<td>Design</td>
<td>(Barnard, 2005)</td>
<td>“The word ‘design’ entered English language from the Renaissance”. “French word dessiner, and later Italian word desegno, which meant drawing, planning, sketching and designing. The root is the Latin ‘Signum’, meaning a ‘mark’”.</td>
</tr>
</tbody>
</table>

Meggs and Purvis have defined the ‘Graphic Design’ through the historical path. Meggs documented innovations in the field and noted the contributions of designers sequentially. In the introspection carried about graphic design, they found that in Europe in the first two decades of the twentieth century there were drastic changes in human conditions because of innovations in technology. Destruction did happen during both world wars deeply affected artists minds, and eventually it influenced visual art and design field as well. It helped creative revolution to happen in the graphic language of form and visual communication. Cubism began in Paris (Key Dates: 1908-1914) which provided a new approach towards design and pictorial space by geometric abstraction of art. Futurism began in Italy (Key Dates: 1909-1944), movement experimented in
typography in visual form in publication design by adding motion, energy, rhythm, and cinematic sequences in the work resulted in animated pages with dynamic, non-linear composition. Dadaism began in France (Key Dates: 1916-1920) a conceptual art movement rejected traditional art using readymade objects by making a modest change in them e.g. montage for book cover design. Surrealism founded in Paris (Key Dates: 1920-1930) affected graphic design by adding fantasy and illusion in imagery using biomorphic forms. Expressionism influenced graphic illustration art by taking inspiration from children art, unschooled artist, tribal arts, and non-European cultures. As a result of these developments the theories about form and colour advanced, and hence creating a foundation for design and design education. All these movements helped graphic designers in the innovation of design by adding new concepts, images, and methods in organizing the visual composition. Post-Modernism (Key Dates: 1960-present) is an internationally adapted simple design style (Megges & Purvis, 2012, pp. 256-275)(Art Movements).

2.5.1 Definitions of Graphic Design

The design experts, practitioners, and academicians have created and operationally set forth numerous definitions on ‘Graphic Design’.

Barnard highlighted the historical relevance and linguistic association with ancient Greek term 'graphein' that means depict signs, and the origin of the word 'design' derived from 'dessiner' and 'desegno' words from English and French languages. It means the process of producing artwork (Barnard, 2005).

Paul Rand, a widely known graphic designer of the twentieth century, strategically defined Graphic Design which, according to him, includes all dimensions of design (Rand, 2014).

Betala thinks that it is a branch of visual communication based on thought processing and conceptualization as well as a two-dimensional form designed bearing in mind human factors (Betala, 2005, p. 46).

Woods’s definition focuses on a successful visual communication aesthetically designed for a focused group with text and image (Wood, 2014).

Many scholars associated graphic design with culture and technology. Shaughnessy brings to light the association of graphic design with principles of design, use of
language, and cultural influence on design (Shaughnessy, 2005). Resnics thinks that it is a form of communication with cultural influence on design to meet the user’s needs, which includes art and technology (Resnick, 2003). According to Tibor et al., it is a medium of communication to express thoughts. It is ubiquitous and is practiced in every culture and presented using various medium with varied technology (Tibor, Miller, & Jacobs, 2015).

Ambrose and Harris think it is a visually appealing communication created for using an amalgamation of thoughts, text and image as well as it presented by using various mediums. A meaningful and skilful arrangement of content helps in targeting audience to understand information effortlessly (Ambrose & Harris, 2008, p. 10).

2.5.2 Modern Graphic Design

Aynsley pointed out those roots of modern graphic design, which are practiced worldwide, especially in the context of publication design. As though the term ‘Graphic Design’ is very recent but its existence can be traced out since very long time. The concept was used in cave paintings of France since c15,000–10,000 BC. Romans also used it for advertising. There are various mediums associated with it, e.g. print, drawing, illustrations, photography, audio-visual, film, etc. As pointed out earlier in different context, before the World War II, ‘Graphic Design’ was known as a ‘Commercial Art’. To cater a newly industrialized society with mass circulations of visual forms such as newspaper, magazines, etc. new courses in 'Graphic Design' developed in art colleges by 1945 in Europe. Today it is a branch of 'Visual Communication' and it covers all types of design from bus ticket to dictionaries, magazine, packaging design, illustrated books, corporate designs, etc. (Aynsley, 2005).

Postmodern Design movement began during 1970s in a western world. International type design style used to emphasize important word or line. The exploratory design was practiced with established harmonious grid system. Publication designs with characteristics such as strong value contrast, clear and simple layout are seen during this period, and the designers incorporated vernacular and historic forms in their designs. Designs were not refined due to handmade process, but since the mid-1980s onwards with the introduction and innovation in digital technology, the computer-generated designs with electronic capabilities became a tool to design an artwork. With the help of digital technology, a new area has opened to the graphic designer as 'Desk Top Publishing'. It has widened the scope of graphic design field in the manipulation of
colour, typography, texture, form, space and imagery using various page making and image editing software. Digital type design has provided numerous old as well new fonts to graphic designers with stylization and variations. (Megges & Purvis, The Influence of Modern Art, 2012, pp. 475-545).

According to Vyas, a senior Indian design academician, the modern awareness of design has originated from the transformation of one concept into the other; that is, the change of design as an ability to show design as a process (Vyas, Design The Indian Context, 2000, p. 25).

2.5.3 Features of Graphic Design

Golombiskty and Hagen think that the purpose of any Graphic Design is to convey information. Controlling readers' eye movement through drawing attention and engaging them emotionally is one of the functions of Graphic Design. To achieve this function, the visuals in the form of imagery, and typography and space work as building blocks. (Golombisky & Hagen, 2010, p. 6).

According to Betala, the key features of the modern graphic design are related to innovation, keen observation, logical thinking, analytical mind, risk taking ability, problem-solving attitude, adventurous in natures-looking out for new dimensions, sensitive about the situation and the needs. It always inclined to contribute and has to understand human behaviour and psychology. Betala has classified design aspects into two main groups– the SOFT and the HARD. Thus, creativity and aesthetics of the ‘softer aspect’ and practicality and functionality of the ‘harder aspect’, make a successful design (Betalal, 2005, p. 11).

Golombisky and Hagen have pointed out that graphic design is a planned activity which involves various stages such as ‘thumbnail sketches’ to define a focal point and to settle content i.e. copy (text) and visuals (images) in given space. To achieve this logical arrangement is considered. Easy in reading, handling, and visual attraction are sensitive issues of any design. Poorly designed layout does not appeal any reader; it is a failure and loss of money and time of any organization (Golombisky & Hagen, 2010, pp. 3-6).

Craig has pointed out that a graphic design and a layout of any print media are two important features of media. Craig studied ideological aspects of publication design and observed that there is an increase in visual sophistication. A modern graphic design has a huge range of possibilities, which include elements such as line art, photography, display
type, various layout styles, white space, contrast, emphasis, visual order, information graphics, grids, etc. (Craig, 1990, pp. 18-27)

Table 2.3: Semiotic method to understand Visual Code of Graphic Design by Robert Craig (Craig, 1990, pp. 18-27)

<table>
<thead>
<tr>
<th>19th Century (mid century)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Elements used</td>
<td>Typographic oriented graphic design.</td>
</tr>
<tr>
<td>Features</td>
<td>More influenced by design which existed before printing</td>
</tr>
<tr>
<td>How it is different from current design</td>
<td>Absence of display typography, line art, and continuous-tone</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Late 19th Century</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Elements used</td>
<td>Decorative typestyles, iteration typestyles</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1870 onwards</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Elements used</td>
<td>Use of line cut depicting logo and products</td>
</tr>
<tr>
<td>Features</td>
<td>Display headlines attract the attention of the reader. In 1880 - halftone process helped in using photographs and continuous tone images in printing. Quality was poor until the first decade of 20th century.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>End of 19th Century</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Features</td>
<td>The new symbolic style introduced in advertising design. More white space with big type size and the illustration based publications.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Early 20th century</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Elements used</td>
<td>Modern publication design was in practice</td>
</tr>
</tbody>
</table>
| Features           | Innovations become conventions as design practice was codified  
The introduction of new graphic elements such as line art, photographs, display typography, varied layout styles, white space and variation in type size and column widths introduced. Through the new contrast meaning emphasis and significance could be indicated. |

<table>
<thead>
<tr>
<th>Current Design</th>
<th></th>
</tr>
</thead>
</table>
| Elements used | Visual Code  
Use of display type, line art, continuous tone |

### 2.5.4 Book Design and its Alliance with Modern Graphic Design

Haslam has stated that a book is one of the oldest forms of documentation, which has a history of 4000 years. Book provides information about world’s knowledge, ideas, and
beliefs. The literal meaning of a book is: ‘a board for writing’, and the word derived from old English word ‘bok’ that has a link to ‘birch tree’. The Egyptians scribes were the first book designers who used columns and illustrations in their scroll format books. The Greeks and the Romans followed design style of Egyptian scroll for writing codex, which included writing in columns. One side of a book which is acknowledged as ‘page’ is derived from Latin word ‘pagina’ which means ‘something fastened’, which has a connection with bookbinding. The books designed by the Greek and the Romans were bounded and were called as codex. These codex-type of books broke the old tradition of writing on the scroll. In codex, parchment sheet is folded and joined one edge to other edge and then piled and bound on one side. Folding of large sheet created two folios. (Haslam, 2006, pp. 6,7). Haslam identified that though the definition of a book is available in various dictionaries, two elements are common in all these; and they can be summarized as ‘portable bounded sheets used for writing literature’ (Haslam, 2006, p. 8).

Roberts described a book design and its various aspects. She thinks the format of the contemporary book is similar to 'codex' books created by the Romans thousand years back, and a book design is the oldest form of 'Graphic Design'. The invention in digital and print technology gave a boost to print various types of publications. New styles and directions constantly being introduced to book design trends. Book genres such as fiction and non-fiction underwent many changes, e.g. cookbook layouts have changed from simple typographic to exciting, mouth-watering photography oriented with good typography, and less cluttered layouts (Roberts, 2004).

According to Sugiura Kohei, a book design is a task done by multiple people, which involve writers, photographers, and illustrators. A designer assembles all these components together by a single idea and form a design, and the final output is a book. This assembly is further taken ahead for printing, binding, and marketing, and finally it reaches to a reader (Kohei, A Cosmos Full of Characters, 2014).

Haslam has pointed out that a book design is a collaborative process, and it involves various team members, e.g. author/writer, illustrator, designers, photographer, editor, proofreader, reader, printer, binder, publisher, etc. (Haslam, 2006, pp. 13-18)

Ambrose & Harris have explained key considerations of publication. They stated that before presenting images and text on a page, a designer must think about the objective of publication and its readers along with page format, print-finishing specifications, etc. (Ambrose & Harris, 2011, p. 18).
Haslam has introduced an approach to a book design using four broad categories, which are common to graphic design. These categories are: documentation, analysis, concept, and expression. A book design process starts with documentation, which is fundamental to a graphic design. Documentation involves information about design brief, manuscript/text, images, a list of figures, photographs, tables, diagrams, etc. The analysis helps in structuring and ordering of content, which creates a pattern. Analysis helps in classification of various elements of content using sequence and hierarchy. The conceptual approach may involve two or more ideas to communicate a message. It may include pun, impossibility, metaphor, fable, etc. The expression is the interpretation of author’s idea using visual elements such as colour, symbolism, etc. of a design. (Haslam, 2006, pp. 23-27)

According to Betala, before a designer begins with a design project, he/she has to make a detailed analytical study of the existing scenario on that particular topic. The factors such as range available, material of final product, the problems face, colour schemes, selling factor, clientele and the target audience has to be studied first. In short, in-depth study or scrutiny of the contemporary market is the very much necessary for a complete understanding of project (Betala, 2005, p. 30).

Lu Jing-ren, a graphic designer from Beijing (China), while designing books or redesigning sacred books always thoughtfully integrates traditional Chinese elements into contemporary book design and tries to revive old techniques of a book making. It gives a fresh sensation to the reader, which is a new way of combining modern elements and cultural traditions. Lu Jing-ren thinks that a book can convey exquisiteness of traditional culture. (Kohei, 2014, pp. 58-59, 61).

### 2.5.5 Components of Page

Ambrose & Harris have found various components of a page and their association with graphic design. They have argued that a white space around text block called ‘margin’. Traditionally the inner margin is double the outer margin on the spread; but currently, the outer margin is found narrower. The top margin of the page called ‘head’ or ‘head margin’. Traditionally head margin is half the footer margin i.e. bottom margin. ‘Column’ is the most basic element of a layout in which text flowed and images placed. The columns give planned look and thereby create an impressive effect for a layout. It gives static look unless variation in size is used in a text block. Space between columns is known as ‘gutter’ space. ‘Running heads’ are also commonly known as ‘headers’,
‘running titles’, etc. On every page, a text is repeated which can be a title of a publication or a chapter. Running head is mainly placed at a header area i.e. the top of the page or at the footer i.e. foot or side margin. Use of the captions for images are different from the body text by a change in a font or making it italics. Most of the time all folio numbers are placed at the bottom of the page on the outer margin or in the center of the page near inside margin. Purpose of folio numbers is to support a reader in navigating within a book pages. Depending upon the place chosen for folio number layout becomes dynamic (center of page) or harmonious (close to outside margin). Outer margin page numbers are easily noticeable while turning the page hence it adds visual weight in design (Ambrose & Harris, 2011, pp. 34,35,66).

Figure 2.24: Components of a Page (Haslam, 2006, p. 20)

Haslam documented 23 components of pages and listed them as seen in Figure 2.22. Apart from these components, there are shoulder/foredge, column depth (height of column), characters per line, and gatefold/throw out (Haslam, 2006, p. 21).

2.5.6 Form and Function of Publication Design

Ambrose & Harris defined form and function of the layout in the area of publication design as: "The form that a layout of a work takes is driven by the function of the design, the ideas and information it has to communicate, the medium in which this will occur and the target audience" (Ambrose & Harris, 2011, p. 103).
Golombisky and Hagen have related a form to material and external presentation of the design. They think that the styles, trends, and innovation in technology influence visual display of design (Golombisky & Hagen, 2010, pp. 2-5).

Haslam has identified three different formats of a book design: portrait, landscape, and square. A book can be of any size and format. While choosing a format one needs to think about few aspects practically to support easy reading such as production and aesthetics. The book should be able to express author’s idea through designer’s angle. Haslam has further stated the relationship of the three elements with the book, namely: format, grid and layout. He further elaborated, for instance, “The format of the book determines the external proportions of the page; the grid determines the internal divisions of the page; and the layout determines the position of the elements” (Haslam, 2006, pp. 30, 42).

2.5.7 Structure of Page Layout using Columns and Grids

Seddon has pointed out that basic horizontal and vertical division of a page is done by using grid. A page further can be divided into margins, columns, gutter space and space between text and image. They form modules and finally create a systematic approach to the process of design. (Tonny Seddon, 2011, pp. 10-11)

Sherin thinks that use of simple grid makes the composition cohesive. She further adds that grid help in making template that gives the designer an opportunity to bring consistency in placing content at similar locations in a long document. This visual repetition makes easy for the reader to find information (Sherin, 2013).

Tondreau has explained numerous types of page layout grids using fundamental of a design. Grids help in placing content on the page and provide order of information. Tondreau described various type of grids namely, single column grid: look like as a block of text. The two-column grid provides flexibility in placement of elements symmetrically as well asymmetrically. Multiple column grids are more flexible than two-column grid and preferably used in magazines. Modular grid is convenient for arranging complex elements on the page using chunking of information. The hierarchical grid is made up of horizontal columns (Tondreau, Layout Essentials, 2009, p. 11).
Ambrose and Harris have elaborate baseline grid such as, “The baseline grid is the graphic foundation upon which a design is constructed. It serves a similar supporting role as the scaffolding does in building construction”. Baseline grid helps arranging content on the page accurately. Cross alignment, a technique also practiced to align text with different sizes, e.g. heading, sub-heading, body copy etc. They further consider that the columns or module-based grids are a significant design tool. A designer commonly develops a flexible grid to arrange visual content (Ambrose & Harris, 2011, pp. 54, 55).

Ambrose and Harris think that a grid helps the designer in deciding the position of elements with accuracy with respect to measurements or proportion of the place. A grid can be complex which provide a number of possibilities for positioning content. It helps a designer to accomplish a great job with the coherent design. Grids can be symmetrical or asymmetrical. The symmetrical grid gives balanced look for the page or spread. It is a
continuous flow of text but can be uninteresting because of lack of variations. In symmetrical page layouts, recto and verso pages of spread are reflections of each other, whereas in asymmetrical page layouts recto and verso pages are same. The asymmetrical grid helps in breaking formal structure by creating a difference (Ambrose & Harris, 2011, pp. 26-27, 44-45).

Figure 2.27: Various Grids Types (1-7) — Visual Representation, Modern Publication Designs. (Tondreau, Layout Essentials, 2009, p. 11), (Haslam, 2006, p. 56)

Haslam has observed that various types of grids are used by designers from ancient times. The grids based on geometric construction were used in the early printed books in the fifteenth and sixteenth century in Europe, when there was no standard and accurate measuring system. They used golden section using Fibonacci sequence, Brinthurst’s chromatic scale, Le Corbusier’s modular grid, Van de Graff cannon, etc. There is another way of page formatting by making simple divisions of space on existing page using international formats such as (i) DIN (Deutsches Institut fur Normaung) or; (ii) ISO (International Organization for Standardization) formats. Division of A0 type paper can be: half of A0 is A1, half of A1 is A2 and so on. Haslam considers that the grids can be used to achieve consistency and coherent form in a book designing. A study of Jan Tschichold found that the books printed in western countries used golden section grid format (Haslam, 2006, pp. 30-33, 42).

Ambrose and Harris indicate that in the field of graphic arts, the golden section is used in artwork sizes. With the help of this principle, visually pleasing balance is achieved in the design. The golden section is practiced since ancient times to the present with beautiful
proportions, comparable to nature. Fibonacci series numbers are harmonious proportions, and are used very frequently in defining a grid, font sizes and text block placements (Ambrose & Harris, 2011, p. 24).

A. Golden Section Grid

B. Van De Graff Grid

C. Tschichold's Golden Canon

Figure 2.28: Various Grid Types (A, B, C) and Representative Sample Layouts


B. Van de Graaf Cannon, Courtesy retinart.net

C. Tschichold's Golden Canon of Page Construction, Courtesy British Library MS 27210, Hebrew Manuscript
2.5.8 Layouts and Compositions of Publication Designs

While expressing thoughts on ‘Composition and Graphic Design’, Stribley suggests that even though the most beautiful graphic element, if not composed very well, goes unnoticed or overlooked. The composition is a cohesive arrangement of various elements, such as text, images, graphics and colours to form a design. She further reveals that a good composition is functional and effective with a variety of arrangement, distribution, and alignments of elements. She suggested ten tips and tricks for mastering composition. These ten tips are nothing but the application principles of design in a composition. They include focal point by scaling object and use of white space around focal point. Adding contrast within elements help in providing leads to user’s eyes. Visual hierarchy creates order of information. Balance in elements, employment of complementary colour schemes, consistency in layout create an impression of cohesive design. Aligning elements and making a strong logical order for reading, using grid or 'Rule of Third' create motion and interest in design (Stribley, 2015).

David Dabner believes that “Composition means a visual structure and organization of elements within a design. Composition involves seeing the whole as greater than its parts and just as important as the individual elements that make up design (text, images, etc.)” (David Dabner, 2010, p. 34).

Riordan and Pauley put across the association of line length and a number of characters with a width of the column and its effect on a page design (Riordan & Pauley, 2004).

Ambrose & Harris express that “A layout is an arrangement of elements of a design in relation to the space that they occupy and in accordance with an overall aesthetic scheme. This could also be called the management of form and space”. It is often assumed as a placement of content on a given space, which has a relationship with measurements, grid, visual order or order of information. In some compositions, a focus is on images and typography. This skill helps a reader to engage, entertain and guide order of preference. They have discussed classically balanced page layout using centralized elements to provide visual consistency and harmony. They further observed that centralized characteristic theme is used in many layouts for placement of images and other content (Ambrose & Harris, Basic Design 02 Layout, 2011, pp. 8-10, 20, 90-91).
Chapter 2: Literature Review

Figure 2.29: Example of Centralized Layouts of spreads

They have described page as ‘space’ and a purpose of page layout is presentable layout for images and text composition. The layout can be structured or unstructured. They suggested that while designing effective publication design the purpose of publication must be considered along with the reader. They further add that format and binding methods are the key considerations for the same. The format is decided accordingly depending upon the type of publication and how it will be read,. The space occupied by various elements on the page and surrounding can have a remarkable impact on the design. If space is less crowded due to low intensity, in that case elements on the page have better visibility. (Ambrose & Harris, 2011, pp. 18-19, 144)

According to Ambrose and Harris, a folio of any book has different elements such as column based grid, columns, headers, captions, folio numbers, head margin, bottom margin, hierarchy, images, etc. Symmetrical, asymmetrical, and modular type of grids are very popular for planning publication design layout. When text flows within the column area, it looks organized. Columns give static look for a design. Within header area, a repeated text matter such as the title of the publication or section can be placed. Folio number is also often placed in this header area. Footer area is the bottom margin of the page. Many a times folio numbers are placed towards the outer edge of the page that create a dynamic look for layout. Footer area is chosen for folio number because it is more noticeable while turning a page, and further adds visual weight to the layout (Ambrose & Harris, 2011, pp. 34-35).

According to Betala, a composition is an abstract arrangement of one or more elements in a given space so as to make it visually appealing. The arrangement is such that it creates a feeling of balance (without making it symmetrical) and harmony, and yet there is space left for visual relief. This balance could be attained both by size of the elements and intensity or depth of the tone. For making a composition visually appealing, there should be a focal point, variety in the sizes of elements and finally absence of parallel
lines and overcrowd. The main factor however remains, that is, visual pleasure though it does not serve any practical purpose (Betala, 2005, p. 74).

Serafini’s opinion about composition is: an arrangement and placement of visual content considering their level of importance. Serafinin had suggested three compositional techniques, which graphic designer employ in their design, they are: 1) size of the object, 2) colour and contrast and, 3) foregrounding and focus (Serafini, 2011, p. 346).

Entry point is the key visual aid, which guides a reader in deciding where to begin with. Use of different colour other than body copy, change in point size and font are a few among various techniques applied to introduce entry points in layout. These techniques are, e.g headings are bigger than body copy and generally use of eye movement tracking software helps in knowing how reader scans through page. 'F' pattern is usually followed to read information, which begins from top left corner to right. Modules helps in placing content, and some modules are more active than the other (Ambrose & Harris, 2011, pp. 94-95).

Elements on page determine the speed of reading or visual study. It is referred as 'Pace'. Designer can control the pace with different graphic devices such as, adding strong graphic statement or adding colour block, etc. Research has shown that the large size text blocks are meant for just to scan through the matter. They act as entry point, and their purpose is to direct a reader, but a smaller type text encourages reading. It is a challenge for a designer while designing a series of pages that a reader should not be disinterested with a monotonous design against this the use of variety of elements may result in achieving overall unity in the layout (Ambrose & Harris, 2011, pp. 98-99).

Page can be divided horizontally or vertically. Vertical blocks promote reader to stop, whereas horizontal division helps in moving eye from left to right, and encourages to turn the page (Ambrose & Harris, 2011, pp. 140-141).

2.5.9 Orientation of Elements on Page

Orientation of elements on a page means the direction in which contents is placed on a page. Generally, in books, newspapers and all printed material the text and images placed in such a manner that they can be readable, and seen horizontally from left to right. Whereas, vertical orientation creates contrast and it is used for headings or for informal text. Such type of arrangement is also used in diagonal type with combinations of $45^\circ$ or
30° & 60°. Weimar, founder of Bauhaus movement in 1919, applied 30 and 60-degree axis. His approach inspired many designers (Ambrose & Harris, 2011, pp. 132-133).

2.5.10 Navigation System in Publication Design

Haslam listed out items related to navigation system of any publication. It includes 'Contents' which is a checklist of articles within a book with page numbers. 'Page Number' which generally begins with chapter one, but in the old system adding of Roman numerals to the first few pages is still in practice today. 'Chapter Opener' works as a section separator for a new chapter. 'Running Heads' are placed at the top or bottom margin. 'Hierarchy of Headings' is created by making change in size and weight of headings. 'Annotations' and 'Captions' for figures, photographs, illustrations, and maps are included in the publication. 'Labels' for diagrams, 'Footnotes' placed at the bottom of a page, 'Colophon' in the beginning before half-title page stating information of author, publisher, editor, date, etc. are parts of publication design. 'Glossary' of technical terms is found in non-fiction books. 'Index' is a list of keywords with their folio numbers (Haslam, 2006, pp. 102-109).

Chisnell has observed that for easy scanning and reading a document, navigational aids such as headers and footers, headings, page numbering, table of contents along with other navigational aids are used while designing a page. These aids help a reader in finding out new information. (Chisnell, Becker, Laskowki, & Lowry, 2009, p. 58)

2.5.11 Typography and Publication Design

Spiekemann and Ginger have define in his work that “Typography is not an art for the chosen few, but a powerful tool for anyone who has something to say and needs to say it in print or screen”. His opinion regarding selecting an appropriate type from thousand typefaces is a confusing process to everyone including practiced professionals. They further explain the use of typography for various industries, e.g. every newspaper uses different typefaces. They are small but easier to read. Headlines of newspaper guide us through the stories. Typefaces give a look and personality to the newspapers. In food packaging design, we recognize different flavours with colour and particular typeface. Sometimes hand lettering is also used in food packaging. For business communication, the typefaces with technical constraints are used; they can be used on screen, and output can be used to take production at low resolution. Tall typefaces with wide space sometimes, mono space for labels, for signage system lean, legible, geometric types are used (Spiekermann & Ginger, 2003).
Ambros and Harris have described various aspects of contemporary typography. They think accents are very common in many languages, which point out the change in pronunciation. Horizontal position of text called alignment. Type selected in a design should be readable, and it is designer's choice to select engaging and readable type (Ambrose & Harris, The Visual Dictionary of Typography : Visual Dictionaries, 2010, pp. 20-24).

2.5.12 Typography – Visual Hierarchy and Line Length

Ellen Lupton, a renowned graphic designer teacher and author of many books on design, states that in a complex page design of newspaper or magazine every element has a purpose or a function. Every reader has their own style of reading; few prefer to look at a picture first; some look at maps, charts and graphs, which are a representation of a complex data. Designer can bring a variety in the layout by using single type family and by using different weights styles. Weights can be from light to heavy. This helps reader to find out the content they want (Lupton, 2012).

![Image](image.png)

Figure 2.30: Typography and Visual Hierarchy (Indesign Tutorial #3 – Interview Article, 2010)

Ambrose & Harris have defined hierarchy as a differentiation shown in typographic style as per importance of level. It can be shown using different font style, size, colour, etc. These typographic styles also serve the purpose of entry point in a document. (Ambrose & Harris, 2011, p. 94)

While explaining how to achieve typographic visual hierarchy, Ambros and Harris have suggested the use of different typefaces in combination by understanding how fonts harmonize each other on a page. Instead of choosing similar type of family fonts, a
designer can select bold *sans serif* fonts for headlines, and *serif* for body copy (Ambrose & Harris, *The Visual Dictionary of Typography: Visual Dictionaries*, 2010).

Deer argues if a type is used in conventional ways it increases readability and helps reader in proper understanding the content. Most of the typographic rules promote readability, and it succeeds through cultural traditions. Currently, there are plenty of fonts available to download from the internet. In spite of their structural form, legibility and consistency they also express emotions. Fonts should be carefully used in expressive typography. Typefaces used in a graphic design create 'Visual Correspondence' by creating association with phenomenon, times, and cultural correspondence. Addition of 'Visual Rhythm' also gives dynamic effect to a graphic design composition by repetition, overlap, movement, spacing, gravity and contrast. (Deer, 2006, p. 310)

According to Chisnell, one of the elements of a page layout design is typography that includes font, font size, leading, line length as well as text alignments and techniques for emphasizing. In a page design, one should use legible font with variations in headings and captions, which should be used consistently. There should be appropriate leading between the lines (1 to 4 points), reasonable line-length (8 to 9 words per line), bold and italics letters can be used to show emphasis or to highlight important information. Testing of a design is very important to know whether people can encourage doing the task (Chisnell, Becker, Laskowki, & Lowry, 2009, p. 60).

Haslam suggests that according to the type of publication the type size should be chosen, e.g. considering adults who read novel type size is set between 8.5-10.5 pt to enable smooth reading experience to the reader (with black colour text on white background). Mostly in a book design, consistency in type size is seen, but change in type size, and weight help in creating visual hierarchy in layout. Tonal value of type, thickness of type, and colour also support visual hierarchy (Haslam, 2006, pp. 86-92).

According to Arntson, the selection of type for any layout is related to six areas, they are: type size, line-length, type style, leading, spacing and format. In consideration of the user selection, a type size is also important. 10 point or smaller point is difficult to read by elderly person, similarly long lines are difficult to read causing difficulty to reader's eye movement. It becomes more difficult with less leading space. Standard line length can be of 50 to 70 characters with legible type or line-length can be double the point size of the type. It is suitable to have more leading in longer line.(Arntson, pp. 106-108).
Ambrose & Harris brought to the notice that if there are more than 60 characters per line then it can be difficult to read a text in single column type grid. It is also difficult for eyes to find or look out next line while reading (Ambrose & Harris, 2011, pp. 30-31).

Haslam has provided rightful information of reading patterns, which are varied according to the publication type, e.g. novel and newspaper-reading pattern. Many books have 40 lines per column; newspaper columns are 96 lines deep, dictionaries 68 lines, thesauruses 70 lines, and telephone dictionaries 132 lines. Non-fiction books may have long columns, and to break the reading experience a small paragraphs is added in between subheadings. Line length is associated with the width of column. Haslam thinks that for continuous reading the best possible line length should be 65 characters. However, they can be between 45-75 characters. Twelve words per column is used in non-technical English literature. Hyphenation causes break to the word that do not fit completely in line without meaning, words but more number of breaks can create distraction in reading. Designer needs to consider hyphenation in justified text alignment, or else they may face problem of extra space between words leading to form rivers of white space with text (Haslam, 2006, pp. 71-81).

2.5.13 Role of Letter Spacing and Word Spacing

Space between letters plays important role, and it creates figure and ground relationship between text and background. If there is too much space between characters then the eye moves between empty space and characters while reading resulting in strenuous experience for the reader. (Arntson, pp. 110-111)

2.5.14 Use of Paragraphs

According to Haslam, the paragraphs are linked up with line breaks, paragraph pilcrow, indent, hanging indents or extend, run-on with symbols and drop lines. Line breaks means breaking the text, and it needs more paper, and a paragraph means dividing concepts in small, readable passages to help reader to comprehend it. Paragraph pilcrow a graphic symbol, used in ancient Greek literature as a bullet signs in front of the paragraphs. Nowadays indents or hanging indent are used to demonstrate a new paragraph. In drop lines, a new paragraph begins where the last line ended. (Haslam, 2006, pp. 72-74)
2.5.15 White Space and Compositions

Sherin's understanding of white space in the layout is that it reduces clutter and helps in highlighting the contents as well as it provides visual pause (Sherin, 2013).

According to Jacci, a white space is one of the important principles of a design. White space means a blank space. Function of the white space is to provide breathing room to the layout and make it less cramped, clear and awesome. White space can be introduced in any layout by indent, by increase space between two lines, paragraph spacing, space between columns, liberal margin space, space around images, and space between headline and subheads (Bear, White Space: How to Add White Space to a Page Layout, 2013, p. 1).

Figure 2.31: White Space in Layout (rafaelhdesigns)

Garcia thinks that a white space around the text in margin area can be symmetrical or asymmetrical. It helps in creating contrast between text, copy and photographs. It helps a reader move his eye direction. It is the most important graphic element in design. In text based layouts, blocking with white space technique used to push the text. In this technique an empty space is being added at one end of page. Special strategy to use maximum space is by addition of indent to a paragraph. White space should be used effectively by adding it more outside the content than inside. And finally lack of white space in layout can give destructive effect to design (Garcia, 1987, pp. 101-102).

Ambrose & Harris suggest that the components of a page should be effectively communicative. There should be focal point and position of elements, e.g. text and image should be placed in such a way that it should form seamless presentation. A designer should seriously consider free space around the text and image. Many designers do not leave white space in a design, and as a result, it creates chaotic effect. When white space
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is used in a design, it generates soothing and tranquil effect on the readers' mind. Generally, publication designs have clear chapter break points (Ambrose & Harris, 2011, pp. 65,90).

2.5.16 Grouping and Chunking of Data

Ambrose & Harris put forward that a book is a collection of related and uniform pages, but there is a need to divide it or chunk the information/data to create pace. The common methods of dividing information are: (i) to add physical page as a section divider; (ii) to add repetitive motifs or image placements at the end of chapter; (iii) by adding breaks and pauses; (iv) by changing orientation of text, etc. (Ambrose & Harris, 2011, pp. 104-105).

As pointed out by Kraus, a visual grouping of certain elements is noticeable because of extra space between other group elements. A reader first looks at the group then individual element from the group. The grouping of elements makes it easy for a reader to relate information with each other (Krause, 2004, pp. 41-43).

2.5.17 Alignment and Balancing of Content

Alignment can be vertical or horizontal, and it is associated with a position of text inside the text block (Ambrose & Harris, 2011, p. 76). In digital composing, especially in the justified alignment, i.e. flush left and flush right a computer adds extra space between words to make lines even (Arntson, p. 111).

Haslam described four basic alignments in a text. These alignments are: left, right, center and justified. In left align type, a text is aligned to left margin and as a result right side looks imbalance. The right margin can create disorder in reading text since text ragged on left side and aligned to a right margin. Whereas a center alignment used for titles. In this type, a text is balanced on both the sides of axis of text block. In justified type of alignment, a text is balanced symmetrically on both the sides of margin. This is the oldest method of alignment for a book-text. Apart from these, tapering center, a forced justified type of alignments also are in use (Haslam, 2006, pp. 76-77).

Kraus suggest that the alignment between various elements placed on a page provide structural framework to the layout. It helps in creating a sense of unity among the elements and the layout looks aesthetically correct. In structured layouts, various types of alignments are applied to elements to accomplish formal or informal look (Krause, 2004, pp. 79-90).
Graham believes that it is important to group information logically, and place the content on a page using principles of design, such as balance and alignment. This help in adding a pleasing order in layout. Alignment of elements connects them visually. It gives organized and balanced feel to the layout (Graham, 2012, p. 13).

2.5.18 Colour as an Influential Tool in Composition

Sherin summarized choice of colour and compositions. Sherrin has described it as the most influential tool for any designer. It helps in structuring project and creating emphasis and a mood. It holds viewer's attention. It is an important factor of compositional balance. Lightness and darkness of colour add visual hierarchy and emphasis in composition. To bring higher contrast in the composition there should be clear differentiation between the colour values used for the elements. Modern designers use colour wheel and models for colour combinations in their designs (Sherin, Communicating with Colour, 2012).

According to David Dabner, "Colour is a powerful tool, especially in information design; it is used to help the designer organize data into various structures. The psychologists have proved that the colour of an object captures the attention of the reader first and then its shape and other components follow it. Catalogues and books often have different colour coded sections to help navigation through pages. Such visual associations can help to delineate sections within a body of text, and highlight a number of different levels of importance. It is observed that the eye picks up this difference very quickly" (David Dabner, 2010, p. 100).

The scholars like Lindwell, Holden and Butler suggest that the limited colour palette help in understanding information quickly. Increases in number of colours add complexity in design. Since saturated colours attract more attention, it adds dynamism in layout and eye catching effect (William Lidwell, 2003).

2.5.19 Visual Appeal through Imagery

While expressing thoughts on history and contemporary aspect of images, Sherin noticed that in cave paintings, the images were used as a communication medium, which narrates stories, but there is ambiguity. As against this in modern times, the images reveal direct meaning instantly. A designer should consider images as a key component of design projects; appropriate image helps in producing interest and desired response from the reader whereas inappropriate image can ruin the entire campaign. Images have a power
to convince, resist, motivate, and give delight. Images help in enhancing content. It is challenge to a designer to communicate mood and style through hand drawn images. Images used in composition to create pattern using scale, proximity, rhythm, cropping and placement. Distance between images shows proximity and scale shows relative importance. Scaling also creates contrast in design and manages to create tension. Images in text-heavy layout work as storytelling material thus help in keeping continuity. Bleeding images placed until the edge of paper create engaging experience (Sherin, 2013, pp. 10-15).

Ambrose & Harris consider that images as one of the elements of graphic design bring life to design. They establish a visual identity for an artwork and play important role in communicating message. The images are placed using principles of layout; they create harmony with other elements. Images add drama and emotions to the layout. Images generally placed using ‘Passe partout’ technique. i.e. border or white space around the design element. This effect helps in establishing focal point to the design element. Images can also be placed next to each other using 'juxtaposition' method. There may be similarity or dissimilarity between the images or elements. Images can help in determining focal point of the composition and control the order of reading. To achieve end results a designer also need to place the image using some design principles such as emphasis, colour, and scale (Ambrose & Harris, 2011, pp. 70,123,156,162).

Jacci argues on using clip art in layout. He claims that the clip arts are wonderful and they add fun factor. Clip art also contributes excitement to the layout of newsletter or poster, but too many pictures will not help reader to concentrate on a document. Clip art, illustration or images should be used in moderate proportion, which support text (Bear, Use Less Clip Art: Desktop Publishing Rules of Image Usage, 2013, p. 2).

Chisnell et al found that the readers like all sorts of graphics such as photographs, illustrations, line drawings, flowcharts, tables, screenshots, icons and images along with text. Graphics help readers in understanding what they read. It is necessary that graphics should be placed near, next to or immediately after text to show their relationship. Graphics can be used for different purposes such as illustrate task and show their relationship between texts. Captions, labels, arrows, callouts are added to draw attention of graphic and to understand its relevance (Chisnell, Becker, Laskowki, & Lowry, 2009, p. 49).
Ambrose & Harris suggested that while placing images in layout, usually it should be placed at x-height and base of the nearest line of text block. This brings harmony in a layout. Nowadays images are also placed at the edge of paper with bleed (Ambrose & Harris, 2011, p. 35).

2.5.20 Appropriation

Ambrose & Harris reported that graphic design could be impacted by art or culture or style of layout; it can be borrowed by some other design. Reason behind copying style may depend upon presenting the information in particular manner for aesthetic reason. Taking inspiration from other design is called 'appropriation' (Gavin Ambrose, Basics Design 02: Layout: Second Edition, 2011, p. 109).

2.5.21 Consistency and Visual Harmony in Layout

Krause suggests that visual harmony in a layout means systematic and aesthetic association of elements on page. Consistency in colour, style, effects, theme and repetition of elements, e.g. symbols, lines, shape, etc. leads towards visual harmony in page layout (Krause, 2004).

Graham pointed out that to bring consistent and united look in design, the repetition principle of design applied in layout. Visual elements such as line, texture, colour, shapes, images, etc. should be repeated meticulously to avoid cluttered look in design (Graham, 2012, p. 13).

2.5.22 Size Relationship

Graham strongly believes that emphasizing of the key element in design is achieved by making it big in size compared to other elements. This helps in attracting the reader’s attention. Principles of design such as emphasis and contrast work together as a result provide different look to the content and add variety in layout by showing visual difference (Graham, 2012, p. 12).

2.5.23 Compositional flow

Rhythmic pattern is built through the repetitive compositional flow of text in horizontal line. (http://www.smashingmagazine.com/2015/04/design-principles-compositional-flow-and-rhythm/)
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Graham states that a flow is the visual path which a reader follows. Focused arrangement of elements in a design help in controlling readers scan path to access information (Graham, 2012, pp. 13-14).

2.6 Use of Technology in Publication Design

Noble assumes the most recent, and probably the most noteworthy progress in the field of contemporary graphic design is noticed after the arrival of the Apple Macintosh computer (in 1984). It has brought a new electronic, digital environment and language in the field of graphic design. Earlier to this, all processes were mechanical (Ian Noble, 2005).

Meggs and Purvis aptly stated that the digital innovation that happened in the late twentieth and early twenty-first century that transformed the entire Graphic Design industry. Introduction of typesetting and image processing softwares expanded scope in creative graphic design. Because of desktop publishing technology handling of the type, colour, form, space, columns and images, etc. and their alteration became very easy. It also produces effective designs in less time. Introduction of typesetting softwares radically changed editorial designs. Font design software made available numerous new typefaces with various styles and attributes. Recently, many font designers developed interest in digitization of preceeding centuries handwritten calligraphic font families. (Purvis, 2012, pp. 530-565)

Tondreau suggested profusely about page making process. In this process, lots of planning is involved at various stages. First, the designer needs to assess the material, e.g. elements such as running text, section heading, subheads, hierarchy of information, charts, tables, necessity of photography. The second aspect is related to production specifications, e.g. production media (print or online), paper quality and type, printing in mono or multicolours, total number of printing pages. The third aspect is determining a format, margins, right kind of typography, leading, font size, and word/paragraph spacing. Design testing is also essential part, which is done on trial and error basis. Designer must know typographic rules also, such as hyphenation, em dash, en dash, widows, orphans, use of quotation marks, spell-checker etc. Finally, designer needs to make a package for printer, which includes linked / embedded images, fonts in document (Tondreau, 2009).


2.6.1 Use of Master Pages, Templates, and Paragraph Style in Publication Design

Frost described prominent features of publication design software (QuarkXpress and Adobe InDesign), which provides ease in designing and it saves time. These features are defining master pages, creating templates and applying styles to characters and paragraphs. Master pages used for placing content, which are common to all pages, e.g. header, footer. Generally, this information is related to page numbers, title of publication or chapter, logo, and other design elements. While defining template of any documents the designer always consider paper size and margin area first. Inside margin area, i.e. working space is further divided into number of columns. Space between the columns is also defined. A page layout can be different for left and right pages. Style sheets are applied to paragraphs and characters for standardizing various attributes e.g. font, size, leading, alignment, kerning, etc. Style sheets are defined along with the template. These pre-defined styles are applied to various type of text, which appears several times in the document, e.g. heading, sub-heading, body text, captions, etc. House style of any publication design is planned with the help of master pages, templates and style sheets (Frost, 2012, pp. 79-82).

According to Alistair & Dabbs paragraph style has all font attribute related information. Changing the format of attribute in entire documents become very easy and can be done quickly if the paragraphs are already given predefined style (Alistair Dabbs, 2005).

2.7 Summary of Literature Review

Researcher identified following research gaps through literature review:

- Previous studies in the area of layout and composition design of the seventeenth century Brahmanical Devanagari manuscripts, have not taken into account with the perspective of ‘Publication Design’ a specialized area for book design under ‘Graphic Design’.
- There is lack of case studies focusing the seventeenth century Devanagari Brahmanical manuscripts.
- There is a dearth of sufficient literature on the seventeenth century manuscript design.
- It is observed that, the earlier study that has been conducted provided a scope to take complete overview of the seventeenth century Devanagari Brahmanical manuscripts and their design aspects with contemporary modern graphic design.
In-depth discussion regarding manuscriptology in India and graphic design with focused study of design aspects practiced in publication design, made the researcher realize that there shall be still a wide scope to compare contemporary design aspects with the seventeenth century Devanagari Brahmanical manuscripts to understand history of book design in India. Hence, the researcher has chosen this topic namely ‘Composition and Layout Design of Seventeenth Century Devanagari Manuscripts in Maharashtra and Modern Graphic Design: Comparative Study of Design Concepts’ for the Doctoral research.