

***Maṇḍala* in Architecture: Symbolism and Significance for Contemporary Design
Education in India**

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Abstract

This paper builds upon the understanding that the knowledge of traditional design concepts, particularly the *maṇḍala*, is relevant for contemporary design education. The significance of traditional principles and practices of design has been undermined by contemporary systems of education. The theory and practice of the philosophy of design are explained using textual references from the ancient treatises on architecture, and analysing buildings and sites of traditional and contemporary approaches to design. A specially devised framework of analytical indicators helps establish the relevance of traditional design concepts and processes for use in contemporary architecture education. An exploration into the current architecture pedagogy identifies the components of teaching structure where potential confluence zones are marked for the inclusion of traditional knowledge content. It is argued that the *vāstu puruṣa maṇḍala* is a philosophical vision and practical tool, which is readily applicable to design education because of its multi-dimensional qualities. A full and in-depth knowledge of the *maṇḍala* will provide value-addition to the critical history-theory and essential context-relevance strands of design education.

Keywords: architecture education, design concept, design philosophy, Indian architecture theory, *vāstu puruṣa maṇḍala*

Introduction

In an Indian context, the traditional building knowledge is codified in the *Śāstras* – the ancient treatises on art and architecture. The Indian building traditions are thousands of years old, and these are explained in much depth in the canonical texts. *Sthapatis* and *Sompuras*, as they are known in southern and western parts of Indian sub-continent, are essentially master-builders who practise this knowledge system, and hand it down to the next generation in its full authenticity and integrity.

“*Vāstu Vidya* or the ancient Indian knowledge of architecture has its first textual reference in the *Rig Veda* and survives today as a continuing tradition, through its fragmentary application by astrologers, craftsmen, conservation architects and priests” (Chakrabarti, 1998, p. 1). In the contemporary practice of architecture, this knowledge, though uninformed and fragmentary, has still found some use. The paper argues that contemporary design education does not provide the desired emphasis on the traditional building philosophy, principles and practices.

The traditional principles of design and the traditional practices of building are both relevant and significant for architecture education. This claim may seem unfounded in the context of contemporary understanding of design, which is largely a by-product of the colonial occupation in the sub-continent and a direct descendant of modernity. The academic content and teaching methods are, to a great extent, drawn from the Western, or rather European, systems of teaching. However, the main central argument of this paper is built upon the idea that the traditional philosophy and methods of design need to be at the front and centre of design education in India.

The rationale behind this argument lies in the concern that though a solid bedrock of traditional building knowledge was available in the ancient Indian context, it was never acknowledged or considered for erecting the foundations of modern education in the colonial India. The knowledge of traditional design concepts needs to be disseminated widely, for it can be argued that a majority of academics and practitioners are either ignorant, or only partially aware, of the fundamental of traditional Indian theory of architecture.

Methodology

The methodology deployed for the study includes an in-depth discussion on the concept of *maṇḍala* in relation to design thinking. The paper has been developed on an inductive approach, guided by qualitative understanding and analysis of the subject matter. It involves a critical inquiry into the two main strands of knowledge concepts, namely: traditional building knowledge and architecture education.

The exploration is based upon a critical insight into secondary sources such as books, journals, research theses and published papers. The observations are also derived from interactive sessions and interviews with traditional knowledge holders and contemporary design educators at building sites, traditional workshops and teaching institutions.

In addition to a critical theoretical context for the discussion, the study also illustrates design projects as cases in point to substantiate the main central argument of the paper.

Literary Context

At the outset, it may be worth clarifying that the paper deals with highly subjective areas of mind and spirit. The discussion attempts to critically engage with the esoteric complexities of traditional philosophies and principles of design. Unlike the more technical and scientific themes of exploration, the traditional design concepts are drawn out using literature and personal interviews of traditional knowledge holders. There is a rather limited literary material available to present a critique.

The design thinkers, academics and practitioners have examined the domains of philosophy, education and practice in a considerable breadth and depth. It is argued that the roots of architecture education in India are in the solid bedrock of traditional knowledge systems, and not in the colonial sub-layer of imported education models. This argument finds resonance in the writings of eminent scholars in the field of architecture education (Chhaya, 2004; Ganju and Dengle, 2013; Mehta, 2001, 2006; Menon, 1998, 2000).

Ananth (1999) claims that the traditional building knowledge is losing its place in the contemporary design sensibility, and schools are churning out professionals who are trained in the Western traditions of aesthetics and art appreciation. Mehta (2006, p.1) suggests that, “while the professional attitude is a western import, the pedagogy requires the issues of a distinct cultural identity and the resolution of the tension between tradition and modern aspirations be integrally woven into the educational philosophy”.

There is work done, albeit limited, that examines the key traditional texts on architecture for their relevance in design practice in India. *Vāstu Śāstra* (ancient treatises on architecture) and *Vāstu Vidya* (traditional knowledge of architecture) are the key subjects of critical engagement and assessment. Acharya (1922) has done seminal work in reading, analyzing and interpreting the ancient treatises such as the *Mānasāra* and making these easily accessible to researchers and scholars working on this subject. His paper presents an overview of the branches of studies that are most essential for an architect to be familiar with.

Chakrabarti’s (1998) research on the Indian architectural theory illustrates the contemporary uses of traditional knowledge in architecture practice. Her work illustrates that a majority of the users of *Vāstu Vidya* apply it with a partial understanding. They choose to refer to only that aspect which serves their own purpose, and ignore the holistic nature of the original knowledge system which they pretend to “know”. This paper argues that whereas the design practice accepts the relevance and uses of traditional building knowledge in a partial and selective manner, the design education should be developed upon an understanding of its coherent nature and unified system.

Discussion

The context of traditional building knowledge is defined primarily, by a critical and in-depth study of the *Mānasāra*, though other cognate texts are also referred. The oldest and most complete canonical group of ancient texts includes *Mayamata*, *Mānasāra*, *Samarāṅgana Sūtradhāra*, *Rajavallabha* and *Vishvakarma Praksha*. The paper considers the first three texts, covering a time period during 6th Century CE to 11th Century CE.

In terms of traditional building knowledge practitioners, the traditional master-builders or *sthapatis*, still continue to apply their age-old knowledge, experience and skills. In order to

gain an in-depth understanding of traditional design principles, structured interviews were conducted with *sthapatis*. Whilst the theory and practice of traditional building knowledge is available in the text, the philosophy of the theory of knowledge is understood in detail only by personal interactions with a *sthapati*. In Southern Indian context, a *sthapati* is entrusted with the conception, design, execution, consecration and conservation of a temple building.

Some of the key research questions are: What is the conceptual base of design in a traditional Indian context? In what way does the symbolism of *vāstu puruṣa maṇḍala* inform the theory and practice of the philosophy of design? What are the possibilities of integrating the traditional knowledge of *maṇḍala* in contemporary design education in India?

***Vāstu Vidya* as the Basis of the Philosophy of Design**

The discussion builds upon the theoretical underpinnings and practical application of the ancient concept of the *vāstu puruṣa maṇḍala*. According to *Vāstu Vidya*, the fundamental aspect of the art and science of architecture is embedded in the “Spirit of the Site” – also known as *vāstu* (Acharya, 2010a; Dagen, 1994; Sharma, 2012). The three critical attributes of a design process are concept, rationale and tools; these are illustrated in what is known as a *vāstu maṇḍala* or a grid plan.

There are thirty-two types of *maṇḍalas* that could be applied to a site depending on the type, scale, function and complexity of a building. In each plan type, a specific place is assigned to the presiding deity who in turn dictates the function or use of that space in a building. This approach is applicable to both sacred and secular architecture.

The first is a site of one plot and is named *Sakala*. A plot could be square, rectangle, oval, polygonal or circular. A site of four plots is named *Paiśācha*, of nine plots is named *Pīṭha*, of sixteen plots is named *Mahāpīṭha*, of twenty-five plots is named *Upapīṭha* and so forth.

The principle of generating plots is:

$$s_x = p(x^2)$$

‘ s_x ’ is the site nomenclature

‘ p ’ is number of plots in that particular site type

For example:

$$s_1 = p(1^2) = p = 1 \text{ plot (Sakala)}$$

$$s_2 = p(2^2) = 4p = 4 \text{ plots (Paiśācha or Pechaka)}$$

$$s_3 = p(3^2) = 9p = 9 \text{ plots (Pīṭha)}$$

$$s_4 = p(4^2) = 16p = 16 \text{ plots (Mahāpīṭha)}$$

$$s_5 = p(5^2) = 25p = 25 \text{ plots (Upapīṭha)}$$

This classification of sites is prescribed until the thirty-second type which has one thousand and twenty-four plots and is named *Chandra-kānta*.

$$s_{32} = p(32^2) = 1024p = 1024 \text{ plots (Chandra-kānta)}$$

It is informative to understand the evolution of *vāstu maṇḍalas* or ground plans for the various types of sites and buildings. Each plan is recommended for a specific function and building type. For example, the *Sakala* plan (refer Figure 1) is proposed for “the worship of gods and preceptors, for sacrifices with fire, for the seat (sitting room) and daily dinner (i.e. dining room) of sages, and for the usual ancestral worship (e.g. *śrāddha*, etc.)” (Acharya, 2010a, p. 25).

Similarly, the *Pechaka* plan (refer Figure 2) is proposed for buildings “for domestic (public) worship and public bath” (Acharya, 2010a, p. 25).

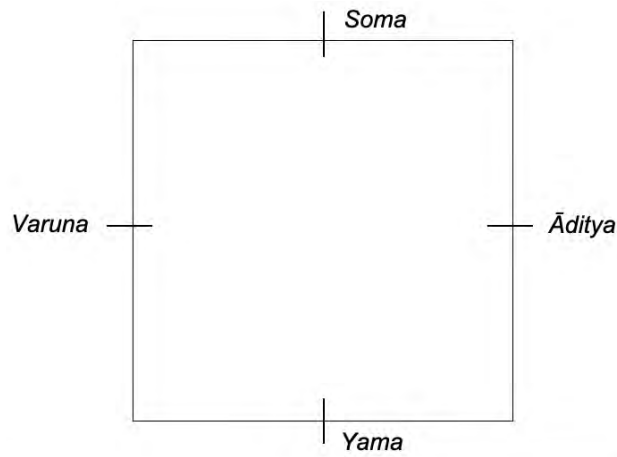


Figure 1: Site of one plot – *Sakala*

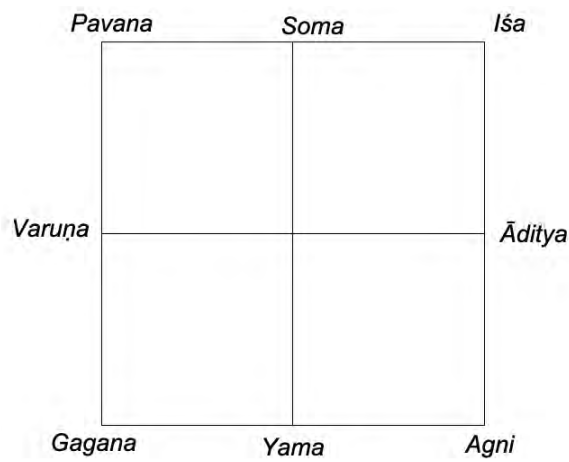


Figure 2: Site of four plots – *Pechaka*

<i>Pavana</i>	<i>Soma</i>	<i>Iśa</i>
<i>Varuṇa</i>	<i>Prithvi</i>	<i>Āditya</i>
<i>Gagana</i>	<i>Yama</i>	<i>Agni</i>

Figure 3: Site of nine plots - *Mahāpīṭha*

Maruta		Mukhya	Soma	Aditi			
		Śosa				Rudra	Budhara
Varuṇa	Mitra	Brahmā				Apavatsa	Jayanta
Pitr		Vivasvat	Savitra	Bhṛṣa			
		Bhṛṅga-rāja	Yama			Vitatha	Kṛśānu

Figure 4: Site of sixteen plots - *Upapīṭha*

Pavana	Mukhya	Soma	Aditi	Iśa
Śosa	Rudra	Budhara	Apavatsa	Javanta
Varuna	Mitra	Brahmā	Āryaka	Āditya
Sugriva	Indra	Vivasvat	Savitra	Bhṛṣa
Pitr	Bhṛṅga-rāja	Yama	Vitatha	Agni

Figure 5: Site of twenty-five plots - *Pīṭha*

(Figures 1-5 are adapted from Acharya, 2010b)

The figures shown above illustrate a few of the many ways in which a plot of site may be subdivided using the concept of *maṇḍala*. An architect could apply the principle of generating plots, as mentioned above, to develop a specific *maṇḍala* or grid plan for a specific site, use and typology of a building.

The Symbolism of *Vāstu Puruṣa Maṇḍala*

The *Mānasāra* provides a conceptual base to conceive, design and develop the most useful and auspicious plan for a building type. In addition to these rather physical attributes, it also assigns a spiritual meaning to the ground plan or *maṇḍala* that is selected and adapted for a site. The presiding deities are assigned to the plots with *Brahmā* always at the centre of the plan; together these constitute what is known as the “Spirit of the site” or *vāstu puruṣa*.

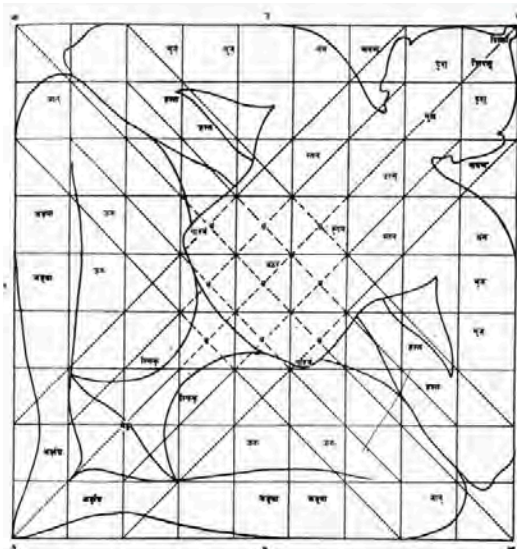


Figure 6: *Vāstu puruṣa maṇḍala*

(Kagak, C. (Ed.), 1986, *Vistāra - The Architecture of India, Catalogue of the Exhibition*
Released into the public domain in 2012-13)

The *vāstu puruṣa maṇḍala* aligns a building site in relation to the four cardinal and four ordinal directions, namely: north, south, east, west, northeast, northwest, southeast and southwest. A site good for construction is always represented as a grid of squares with the *bindu* at the centre-most point. This point of reference is both the void and the soul of the site.

The form of the *vāstu puruṣa* or the “figure of Man” overlaid on a *maṇḍala* or the grid is “beyond form” (Vatsyayan, 1997, p. 99). The *Samarāṅgaṇa Sūtradharā* explains this “figure of Man” as the “Spirit of the site”. The head of the *Puruṣa* is located in the northeast direction, whilst the feet go in the southwest direction. The knees and elbows signify the northwest and southeast directions. In the centre, and kept always clear, is the navel located at the intersection of the cardinal and ordinal directions.

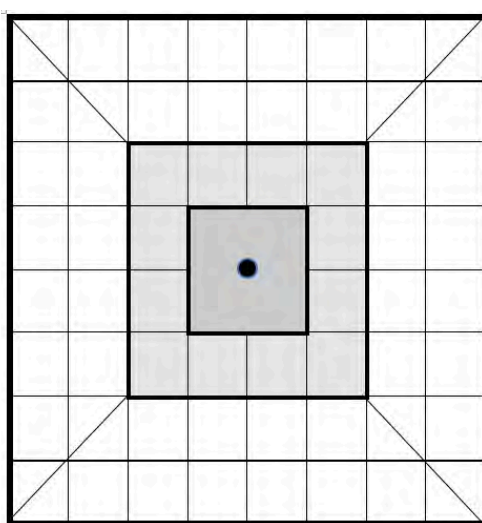


Figure 7: *Vāstu maṇḍala*

(Based upon discussion with Dr Narasimha)

A 64-square *maṇḍala*, known as the *chaṇḍita* (refer *Mānasāra*, chapter 7) is shown above. It is developed upon discussions with Dr Narasimha, a renowned *sthapati* (master-builder) and *silpachariar* (teacher) in Chennai. The centre-most part of the *maṇḍala* is called *Brahmabindu*, and it marks the source of all energy. It is also the centre of the cosmos and establishes the *genius loci* of the site. At this point and the immediate space around it is located the *Brahmam* – the Supreme Almighty; the *arupa* – the Formless, the Ultimate God or the Spirit of the place.

Vatsyayan (1986) explains the *vāstu puruṣa maṇḍala* as:

The *mandala* is not a plan; it represents an energy field. And, as in the case of the black holes of outer space, at the dead centre of the vortex is Nothing...which is Everything. It is both *shunya* (the Absolute Void) and *bindu* (the world seed and the source of all energy). In all *mandalas*, at this centre is located Brahman, the Supreme Principle.

The Theory of the Philosophy of Design

The classical Indian philosophy of design is built upon the notions of the outer world and inner self, and the material desires and spiritual consciousness. The symbolism of *Puruṣa* is key to the understanding these interlinked notions of the macrocosm and microcosm: the whole and the part.

Vatsyayan has done considerable research on this subject and has traced the symbolism and significance of *vāstu puruṣa* and *maṇḍala* from the Vedic period through the later treatises on art, architecture and sculpture. Her critical and in-depth study of *Nāṭyaśāstra* suggests that the notion of *vāstu puruṣa* and the associated concepts of time, direction and space, were understood and applied in the field of performing arts, particularly theatre, much before they were used in architecture.

“In Bharata’s propitiation of the different directions and the deities of each of the direction, the establishment of a centre and main axis and the placing of pillars, one may receive remarkable correspondence with the imagery of the Upaniṣads and the ritual of the Brāhmaṇas. All establish the relationship of the physical with the psychical and the metaphysical” (Vatsyayan, 1997, p. 40).

This understanding of the relationship between the physical and the metaphysical, and the microcosm and the macrocosm provides a solid foundation and bedrock upon which traditional building knowledge has been erected.

In the ancient Indian design philosophy, the conceptual ideation of “form” deployed physical and spiritual processes. Some of the critical approaches include the use of: the human body or *Puruṣa* as a measure of design; the rituals and ceremonies as metaphoric links between the physical and metaphysical or the form and formless or the world order and the cosmic order; the assigning of directions and locations to Gods and presiding deities; and the establishment of the centre of a site and setting up of the *axis mundi* or *stambha* as a symbolic connection of the earth with the heavens, of the microcosm and the macrocosm or of the part and the whole.

It has been established that this knowledge existed in the Vedic times and was passed down over several millennia to medieval times. Arguably so, but it may not be incorrect to claim that certain aspects of this ancient knowledge continue to be applied even today by traditional master-builders.

A full and in-depth understanding of the concept of a *maṇḍala* is key to architecture as a creative design discipline within this tradition and as a meaningful building activity. Whilst the knowledge of the traditional concepts of design is codified in *sāstras* – the ancient texts, the understanding of this knowledge and its practice resides in *sthāpatīs* – the traditional master-builders. A tangible concrete expression of this traditional building knowledge takes the form of standing buildings - sacred and secular - in which these age-old knowledge systems are embedded.

The Practice of the Philosophy of Design

The intention of establishing a correlation of architectural members in a building, particularly a temple, with the figure of Man or *Puruṣa* was to reinforce the symbolic connection between a finite structure and the infinite macrocosm. Further layers of symbolism were imbued in various building elements like plinth, ceiling, projection, entablature, decorative carving, sculpture, painting and so forth. Every architectural member of a building had symbolism or meaning imbued in its form, location and expression, such that the overall building design, in its entirety, was a true reflection of the larger whole or macrocosm.

In a building, particularly a temple, each component of its form and design relates to a specific aspect of the macrocosm and follows the consideration of the eight fundamental ingredients of the philosophy of *Vāstu Vidya*. These ingredients are: *bhūta* (material), *kāl* (time), *prakṛti* (nature), *diśās* (directions), *nakṣatras* (planets), *rasā* (experience), *yajna* (ritual) and *Puruṣa* (the self). Another critical element that is embodied in a building is “energy”.

Narasimha, in his explanation of temple design, lays a strong emphasis on the relationship between design and energy. “Design provides energy to the *lingam* and sanctum sanctorum or *garbhagrāhā*” (M. V. Narasimha Silpachariar, personal communication, February 2018)

The *maṇḍala* is not a mere diagram or a mathematical grid to be used as a base for the conceptual design and allocation of spaces and functions on a site. If understood fully and applied judiciously, a *maṇḍala* symbolises an energy field. It is this energy and its modulation that guides the design process. A *maṇḍala* is not a mere tool for design, it is the essence of design. This understanding forms a critical conceptual base for traditional design process.

It is important not to view a construction site as physical ground only, for the earth is a primary source of energy. The main objective of design is to engage with this energy through and around a building. The experience of this energy is not as much associated with the aspects of mass, as it concerns the attributes of life. The energy that is trapped in the deep core of the earth gets channelled up through the site and gets embodied in various parts of the building. This transmission of energy takes place through the process of design, construction and *yajña*.

“When an empty space is enclosed by four walls it becomes a living organism”, says Narasimha (M. V. Narasimha Silpachariar, personal communication, February 2018). A space in a designed enclosure is no longer a dead or empty space; it contains energy or life. It can be modulated and assigned a use as per design and requirement. The architecture of a building with its structure, sculpture and ornamentation renders this space alive, meaningful and powerful.

The design of a building and its various elements is extremely crucial. It has the potential to accentuate or undermine the impact of this energy at a metaphysical and experiential level.

Each element of design contributes to this phenomenon of multiplying energy, which is further augmented with proper recitation of the right *mantrās* and offerings by a temple priest.

“*Mantrā*, *Yantrā* and *Tantrā* – all three play an important role in temple design” (M. V. Narasimha Silpachariar, personal communication, February 2018). Here, *Mantrā* is recitation of hymns for the invocation of Gods, *Yantrā* is a temple plan based on the *Vāstupuruṣa maṇḍala*, and *Tantrā* is the ritualistic practice or methods for a divine experience.

There are innumerable examples of buildings and places, both in the traditional and contemporary Indian context, which exhibit the relevance and use of traditional building knowledge. These were designed on traditional principles of design, and constructed in conformity with traditional practices of building. We now discuss a couple of such examples to illustrate the concept of a *maṇḍala* in design.

The Example of Shore temple, Mamallapuram, Tamil Nadu

The Shore temple was constructed during the reign of King Narasimhavarmā II (AD 700-728) (Meister, 1999; United Nations Educational, Scientific and Cultural Organization, 2018). In 1984, the site was inscribed on the UNESCO World Heritage List under the title “Group of Monuments, Mahaballipuram” (UNESCO, 2018). The other sites in the group of monuments include: rock-cut rathas, sculptured scenes on open rocks like Arjuna’s penance, the caves of Govardhanadhari and Mahishasuramardini, the Jala-Sayana Perumal temple... (Archaeological Survey of India, 2018). All these sites exhibit an outstanding quality of stone work; cutting, chiselling, masonry, rock-cut, surface relief, carving and ornamentation.



Figure 8: The Shore temple, Mamallapuram

The temple is a complex of three shrines: west facing – Viṣṇucchanda vimāna (the Rājasimhēśvara), east facing – Brahmachanda vimāna (the Ksatriyaśimhēśvara), and in between these two and east facing – Narapatisimha Pallava Viṣṇugṛha (Meister, 1999). Hardy (1995) introduces a profound idea concerning classical Indian temple architecture. He suggests

that the “architectural forms embody an Indian concept of manifestation, of the coming into concrete form of the divinity and, on a cosmic level, of the transmutation of the eternal and infinite into the shifting multiplicity of existence, and the reabsorption of all things into the limitless unity from which they have come” (p. 4).

Hardy’s suggestion forges an inextricable connection between the architectural form and faith, at a metaphysical level and between the built form and conceptual ideas, at a more tangible level. Built form is a manifestation of ideas, and the ideas give symbolism to form. This is an Indian approach to design thinking and practice and is one of the fundamental aspects of traditional building knowledge.

The understanding of the concept of manifestation is explored further by Kramrisch (1946, p. 165): “The temple is the concrete shape (*mūrti*) of the Essence; as such it is the residence and vesture of God”. A temple building, along with its form, space, composition, imagery and material is the tangible construct of the Spirit or the *Brahmam*. It is a concrete representation of the microcosm and macrocosm, of the man and universe, and of the cosmic Man and cosmos.

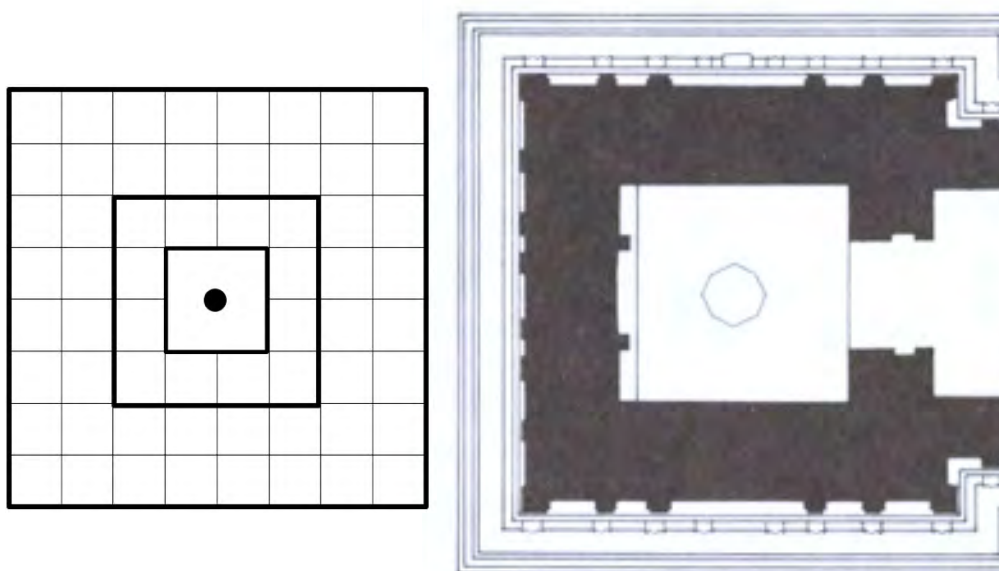


Figure 9: Sketch of a Maṇḍala in relation to the Plan of the *garbhagr̥ha* of the Shore temple, Mamallapuram

(Adapted from Meister (Ed.), 1999)

Photo: American Institute of Indian Studies (Permission granted 19.11.20)

Architecture is perceived and experienced as a form of energy and movement; it is not a static form of expression. It has its own kinetics and dynamism, which might be more evident in one kind of architecture than in another. In the classical Indian temple buildings, it is one of the essential governing aspects of design, construction and experience. The most evident design element in a temple building that conveys the notion of movement or energy is the *vimāna*.

The energy is drawn from the inner depths of earth towards the central point of the *garbhagr̥ha*, and from here it moves upwards and inwards. In architectural terms, the building mass expands from the centre of the *garbhagr̥ha* in all directions in the horizontal plane. This mass with, its formal, decorative and other constituent elements, reduces to a point at the top-most level of

the superstructure. The formal treatment of the *garbhagrha* and the *vimāna* embody this dynamism or transmission of energy.

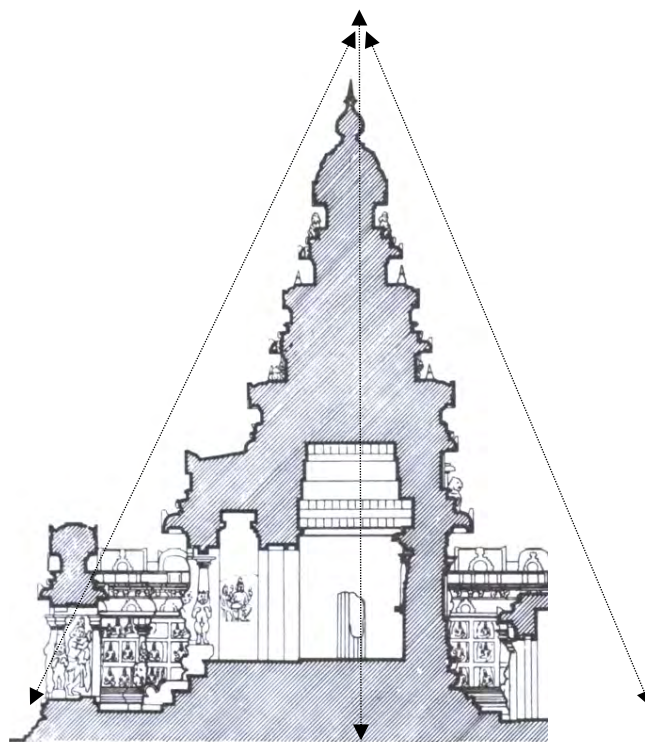


Figure 10: Section through the Shore temple, Mamallapuram
(adapted from Meister (Ed.), 1999)

Photo: American Institute of Indian Studies (Permission granted 19.11.20)

The figure presents a section through the *garbhagrha* and the *vimāna* of the Śiva of the Shore temple. The two-way arrows illustrate the flow of energy and the underpinning of the Spirit of the site. The movement of energy is not only upwards, but also downwards. Whilst the overall form of the *vimāna* is seen to be receding upwards, the architectural and decorative elements seem to reveal the cosmic and mythological symbolism as the whole shrine expands downwards (Hardy, 1995).

The Example of Jawahar Kala Kendra, Jaipur

Designed by Charles Correa in 1986, the Jawahar Kala Kendra functions as a cultural centre for the city Jaipur, Rajasthan State, India. The centre is dedicated to the memory of India's great leader Jawaharlal Nehru.

Correa explains that the Jawahar Kala Kendra is “a contemporary construct based on an ancient perception of the non-Manifest World, as expressed in the *vastu-purush-mandalas* – those sacred Vedic diagrams that have been of seminal importance for Hindu, Buddhist and Jain architecture over many centuries”. (Correa, 1996, p. 28). A *maṇḍala* with a central space as an absolute void or nothingness (*shunya*), and simultaneously a point source of all energy or everything (*bindu*), is a “truly mind-blowing concept”, says Correa, “similar to the black holes of contemporary physics” (Cruikshank, 1987, p. 57).

It is important to note that this design evolved from a renewed interpretation of the original concept of *vāstu purush maṇḍala*. It is a nine-square plan, but the squares are not assigned to Gods. Correa's *maṇḍala* illustrates the adaptation of the original and traditional knowledge

concept. Here, the nine-square grid signifies the *Navagraha* – the nine planets, and each square denotes a planet and contains functions that relate to that planet. The central square denotes *surya* – the source of all energy and creation.

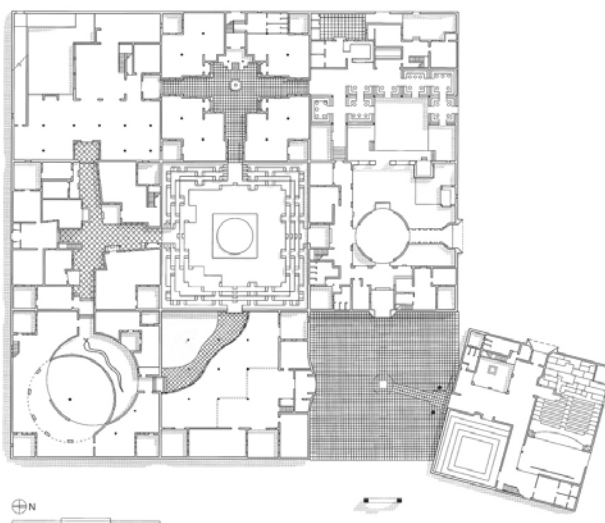


Figure 11: Floor plan, Jawahar Kala Kendra, Jaipur

<https://archeyes.com/wp-content/uploads/2020/02/concept-drawings-jawahar-kala-kendra-charles-correa-museum-floor-plans-4.jpg?w=150>

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The design of the centre has remarkable similarity with the plan of the historic city of Jaipur. The conceptual approach draws inspiration from the original city plan of Jaipur, “drawn up by the Maharaja, a scholar, mathematician and astronomer, Jai Singh the Second, in the mid-17th century” (Khan, 1987, p. 142). Jai Singh’s plan was strictly based on a 9-square *mandala* or nine houses representing the nine planets. Due to the presence of a hill to the north of the city plan, the square along the northwest direction was moved to the bottom, along the square along the southeast direction.

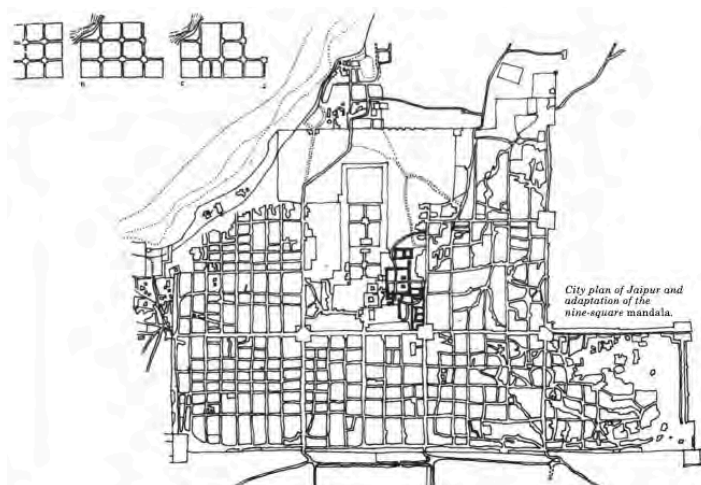


Figure 12: Plan of the historic city of Jaipur

Kagak, C. (Ed.), 1986, *Vistāra - The Architecture of India, Catalogue of the Exhibition*

(Copyright, Charles Correa Associates, courtesy Charles Correa Foundation. Permission granted 20.11.20)

Correa's plan invokes the *navagriha* or nine house *maṇḍala*. Analogous to the original city plan, one of the nine squares of the centre is pivoted. In conformity with the *sāstras*, the central space is an open-to-sky void, whilst rest of the squares house covered or semi-open functions.

The Example of Vidyadhar Nagar, Jaipur



Figure 13: Conceptual sketch of Vidyadhar Nagar township, Jaipur
https://www.sangath.org/uploads/images/1535114309_6-Vidhyadhar%20Nagar-Jaipur.jpg
 Photo: Vastushilpa Foundation Archives (Permission granted 21.11.20)



Figure 14: Layout plan of Vidyadhar Nagar township, Jaipur
https://www.sangath.org/uploads/images/1535114309_11-Vidyadhar%20Nagar-Jaipur.jpg
 Photo: Vastushilpa Foundation Archives (Permission granted 21.11.20)

The final example for discussion is the masterplan of Vidyadhar Nagar, a satellite town for the historic city of Jaipur, Rajasthan. This contemporary township was designed by the Pritzker Award-winning architect BV Doshi in 1984. The city plan was conceived on the main premise “to bring together the best of traditional and modern design” (Sachdev, 2011, p. 94).

Doshi's *mandala* invokes the traditional principles of town planning in order to address the complexities of a modern city design. The application of traditional building knowledge is reconfigured to provide solutions for contemporary issues of liveability, development and sustainability. The township promises to provide an experience of a paradise where the inhabitants are happy and healthy. There are employment opportunities, and they live well. There are markets, schools, offices, parks and waterbodies for an enjoyable and fulfilling life.

The layout plan of Vidyadhar Nagar is a “synthesis of reformist urbanism of Le Corbusier with its emphasis on nature, circulation and hygiene – the essential joys of light, space and greenery; and the ancient urbanism of India with its tight streets, urban courts and mixed uses” (Curtis, 1988, p. 29).

It is argued that the planning of the historic city of Jaipur served as an influence, or a wider context, for the urban design of Vidyadhar Nagar. However, it does illustrate that the considerable modifications and adaptations were made to the original concept to ensure its contemporary relevance and future utility.

Relevance of Traditional Design Concept in Contemporary Design Education

The relevance of traditional concepts of design has been established for both practice and education. Whilst there are examples that demonstrate the use of these concepts in a range of building typologies, scale and functions; particularly the *mandala*, the use of traditional design principles in architecture pedagogy is far from satisfactory.

We argue that although traditional building knowledge is relevant for contemporary architecture education, current pedagogic content and methods do not provide sufficient emphasis on the traditional principles, concepts and skills of design. This relevance of the fundamental aspects of traditional knowledge can be assessed with the help of a set of indicators, namely cognition, relativity, context, innovation, trust and future utility (Piplani & Brar, 2020). These indicators are operationalised as follows, and then applied to the contemporary architecture education system:

- a) Cognition is an attribute of assessment which is associated with an interest in and the worth of knowledge content. An individual must find it worth an effort to gather and process the inputs, for he/ she is assured of greater positive cognitive effects (Wilson & Sperber, 2004).
- b) The attribute of relativity identifies with the quality of knowledge content in terms of its usefulness, meaning and authenticity. It works on the assumption that all information is relevant for a specific context and time; only the degree of relevance varies with a situation(s).
- c) The context of knowledge content is defined by the original source from where the knowledge is drawn, interpreted and communicated to an individual. In comparison to intuitive or experiential teaching, the knowledge content that is contextualised in its own original source is of optimal relevance and facilitate constructive learning.
- d) Innovation in knowledge content, in order to sustain the relevance of knowledge for the changing times and contexts, is at the core of the assessment of knowledge. New and imaginative pedagogy content that satisfies expectation and learning capacity sustain a higher level of relevance as compared to conventional or traditional methods.

- e) Another key attribute of the relevance index is trust. The information that will lead to true conclusions and preclude the possibility of any falsification are of maximum relevance to an individual. Therefore, it is essential that the knowledge content, its source of origin and medium of delivery are trustworthy.
- f) The knowledge content that is valuable not only in the contemporary context but will remain useful in the future as well, has a greater relevance. The indicator of future utility ensures the continuity and validity of knowledge content in the long-term.
(Piplani & Brar, 2020)

The Contemporary Architecture Education System

In the current architecture education curriculum, three broad strands for teaching-learning may be identified. These are derived from the minimum standards of architectural education regulations (1983) prescribed by the Council of Architecture, and are discussed as follows:

- i) Theoretical component in which structured lectures, presentations and seminars are offered to students. This may also be considered as a taught component of the curriculum, and depends primarily on text-based learning,
- ii) Applied component in which pre-determined exercises with gradually increasing complexity through the years are given to students. This may be considered as a part-taught and part-practice component of the curriculum.
- iii) Practical training component in which professional exposure, practice and experience is gained by working in an architectural office. This may be considered as a professional ability and skills enhancement component of the curriculum.
(Piplani & Brar, 2020)

The three components of design education are not mutually exclusive, but they are interconnected and inter-dependent. All three components need to be undertaken in a balanced way in order to achieve the overall vision, aim and objectives of architecture education.

In terms of the theory of the philosophy of design, the architecture pedagogy in India has drifted apart from the traditional principles and practices. It is argued that India's current architecture pedagogy receives its inspiration from the Western, or rather European, systems of teaching, both in its content and method.

In this respect the foundations of contemporary architecture education in India are erected upon a rather superficial sub-layer of the British colonial era, though a more solid bedrock of traditional building knowledge also lies much deeper in ancient Indian history.

TB Macaulay's Minute of Education of 1934 (Tillotson, 1989) underpins the primary intention behind the type of education propagated in British colonial India. The sole objective was to create a whole new cadre of assistants, trained in westernized attitudes, to serve the colonial masters in the administration. The use of English language played a critical role in fulfilling this intention and consolidating the British colonial political agenda in the country (Piplani & Brar, 2019).

However, it is an entirely different scenario today, in post-independence India. There is a greater emphasis on the indigenous aspect of education; this is particularly relevant and

applicable in the domain of architecture education. Today, there is a unique opportunity for the reversal of the catastrophic phenomenon that resulted in a slow erosion of the traditional knowledge of architecture and the traditional method of learning, which is rooted in ancient texts and cultural practices.

Questions that arise at this point are:

- a) In what way might the inclusion of traditional building knowledge add value to architecture education?
- b) What are the possibilities for embedding the ancient knowledge of *maṇḍala* into contemporary approaches to India's design education?

Possibilities

***Maṇḍala* in Design Education**

The concept of *maṇḍala* and the principles for its use in design are illustrated using examples in the previous section of the study. The indigenous Indian philosophy of design, codified in the knowledge of a *maṇḍala*, has been a source of inspiration to traditional *sthāpatis* and continues to do so for modern architects as well.

It is essential that this vast knowledge and unique inspiration imbued in the traditional concept of design is incorporated in the content, framework and methods of contemporary architecture education. The value addition to the current system of education will potentially impact at two levels – first, add value widely across the domain of critical history of architecture in India, by establishing the contemporary relevance of traditional building knowledge; and second – imbibe meaning more specifically to architecture pedagogy, by offering a contextual-learning framework.

In terms of possibilities for integrating the traditional understanding of *maṇḍala* in design education, this paper suggests identifying significant correlations between the knowledge content and design approaches. This is an innovative knowledge concept where the fields of confluence are identified between traditional concepts of design and contemporary approaches to learning. These fields of confluence are:

- a) Principles and concepts of knowledge content,
- b) Methods and tools for critical abstraction, and
- c) Skill sets and practices for informed use.

The knowledge of fundamental principles of *maṇḍala* as a design concept will connect with the “theoretical” component of architecture curriculum. This will provide a solid philosophical foundation to the design process.

The knowledge of primary methods for a critical abstraction of *maṇḍala* as a design tool will connect with the applied component of the curriculum. This will provide an in-depth analytical framework for the design manifestation.

The knowledge of essential skill sets to use *maṇḍala* as a design representation will connect with practical training component of architecture education. This will provide meaningful articulation of the design experience.

Conclusion

The current architecture education system, first imported and later imposed, on the Indian context is not going to yield the desired outcomes as it does in its source of origin. The understanding and experience of design in India is strikingly different from that in the western context, or more specifically Europe, from where the current design pedagogy continues to receive inspiration. In India, the traditional building knowledge continues to be relevant, but its significance is neglected and unheeded by the dominating presence of contemporary design education.

The paper recommends a meaningful and inextricable inclusion of traditional building knowledge within India's contemporary design education. In this respect the *vāstu purush mandala* is both a concept and a tool for design, and is applicable to contemporary design because of its multi-dimensional and multi-directional qualities. We propose that the study, interpretation and use of *mandala* in education will provide a critical theoretical position to secure this design more firmly in tradition. It can also provide an effective tool and method to situate a design in its own context of time and space.

The key consideration, however, is to ensure a critical focus on the philosophy and symbolism of *mandala*, more than its mere understanding as a grid or tool. We suggest that an innovative and judicious application of the design *process*, rather than of geometric pattern, would render the *method* of teaching more informed, worthwhile and authentic.

In conclusion, the application of *mandala* in design will require an expansion of the traditional knowledge content to include the realities and challenges of the contemporary world, that is, modern materials, construction techniques, development pressures, climatic changes, lifestyle trends, information technology, and economic considerations.

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