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Chapter 5

Imageability of South Indian temple city- A Case study on Madurai

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Introduction

During the recent years a high degree of research is being witnessed on designing various approaches in preserving the heritage in a holistic way. Where, the concept of heritage conservation is being developed by considering more factors which have both direct and indirect effect in protecting the heritage. As far as Indian context is concerned, the urban forms are recognized for their architectural fabric and spatial setting individually but not as a single unit. Most of the historical city cores of India consisted of magnificent architectural structures which majorly contributed to the identity of these towns or cities. These structures usually have a strong influence on the area weaved around it. As the urban identity is celebrated not just by its magnificence and formal functions but majorly by its meaning perceived by the users of the place, a holistic approach is needed to both understand and preserve the sense of belongingness in the historical cores. According to Derya, inhabitants should feel as elements of the environment they belong to; both collectively and individually ((Oktay, 2002). Stemming from the writing of David, sociological function at some level is related to the spatial structure of a city as they function with many integral variables ((Harvey, 1973). In the process of contemporary urban growth, few of these historic towns which were once equipped with high potential are now neglected and struggling to survive. Further, unplanned urbanization, uncontrolled industrialisation and unmanaged globalization led to distortion of socio-economic sustenance of various communities. The modern political support in this context is very poor and had tended to concentrate on superficial cosmetic treatment rather than holistic and meaningful approaches towards the conservation of these important historic cities and revitalisation of such communities.

Background

The urban character of the historical zones of metropolitan cities is subject to a rapid shrink in response to the changing urban face and built density. Preservation of the character of these historic zones has been a challenging across the world. As per the writings of Anne, environment consists of certain physical/spatial elements interdependent on each other to operate as a single unit ((Stenros, 1992). Most of the historical zones operate as independent social organism where the heritage buildings act as nerve cells. These heritage buildings are positioned in such a way that they knit visual webs throughout the historical realm and manifest as strong urban identities. The urban identities together with its spatial and visual attributes form the imageability of the space. Architectural paradigms constructed by the ancient rulers express their objective to establish a powerful and extensive state. Their structures are robust in terms of character, architectural precision and scale (Champakalakshmi, 1978).

Need of the study

'Built environment' is the physical component of the urban fabric which is the tangible version of the social environment and physical environment. Everything that is humanely arranged, maintained, modified, or created is considered as the built environment. Therefore, the processes and the products created by human are collectively called as built environments (McClure & Bartuska). Every city's-built environment is addressed with a unique formula designed in response to the interrelationship between environment and man.

The city's-built fabric consists of patterns formed by built and un-built (spaces) elements. These spaces are linked to each other forming "system of spaces" and the spatial configuration of a place is determined by the composition of these spaces. A continuous transformation can be witnessed on the spatial configuration which is in response to the user preferences in the form of socio-cultural behaviour that is subjected continuous

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evolution. The face of social life can be easily decoded by the spatio-temporal setting and built morphology of a particular space (Rapoport, 1991).

Firstly, there is a dire need to understand the genetic code of the urban morphology as it illustrates the user preferences of a specific place. Secondly by understanding the urban morphology of the historical cores, where some qualities can be borrowed on to the contemporary built fabric. Thirdly there is huge gap in understanding the built patterns as visual geometry is often overseen as an integral part of planning. Therefore, it is important that the city is analysed in holistic way, i.e., considering the visual connectivity, social bonding, cultural fabric as well as the auxiliary function of the city.

Research Structure

Research questions or hypotheses

The main research question addressed in this paper is: How can we understand and preserve the urban heritage of historical cores, with a focus on the Indian context?

Objectives

To examine the intricate relationship between built environments, social dynamics, and cultural significance in historical cores.

To highlight the importance of a holistic approach to heritage conservation.

To analyze case studies, such as Madurai, to elucidate the complex interplay between urban morphology, cultural memory, and collective identity.

Methodology

The study utilizes a combination of qualitative and quantitative research methods, including data collection through surveys, spatial mapping, and visual documentation. Sample size, data collection methods, and data analysis techniques are detailed in subsequent sections.

Expected contribution

This study aims to offer valuable insights into the challenges and opportunities inherent in preserving and revitalizing historic cities, particularly in the context of rapid urbanization and socio-economic transformation. Its findings may contribute to the development of new knowledge, theoretical insights, practical applications, or policy recommendations in the field of heritage conservation.

Literature

Imageability and Culture

Most of the celebrated historical places are recognized by their unique identity which illustrated by Lynch as 'the extent to which a person can recognize or recall a place as being distinct from other places (Lynch, 1984). These identities are a product of immense experience and experimentation in time and reflect both in micro and macro levels. Kevin Lynch in his work "The image of the city," illustrates imageability in three components: meaning, structure and identity. Where meaning refers to the figurative representation of the connect between function and the built form, while structure refers to the spatial setting that represent the function and identity refers to notable features of the space (Lynch, 1976). While Richard Hartshorne in his concept of centripetal and centrifugal forces categorizes culture as a strong centripetal force responsible for unifying a whole settlement (Hartshorne, 2008). The landmarks often act as epitomes of local cultures and have a great influence on the surround settlement. As per the writings of Sarah, the historic environment can be understood and appreciated by its view capes. The composition is done in such a way that certain elements are viewed as a unit while the others enjoy focused view, which is most common on the historic fabric (Green, 2015).

According to Norberg-Schulz the inhabitants of a place are exposed a definite environmental character, where two psychological functions are involved identification and orientation (Norberg-Schulz, 1968). To address the same the landmarks are usually blown out of human scale and positioned at the central core of the city, to maintain the visual connect and serve the function of identification. While the architectural fabric and the spatial fabric of the settlement shows a high degree of orientation to the landmark serving the function of orientation.

Collective memory

The term 'collective memory' has been coined by a sociologist Maurice Halbwachs in 1950. In his writings he focuses on the social character of the human subject by analysing the individual memory. He further illustrates how most of the shared activities happen in social frameworks and how these social frameworks feature as identities in individual memory (Halbwachs, 1992). Collective memory can also be understood as a

reconstruction in the present understanding the past and being compatible with social character of the people (Mack & Hirst, 2008).

Collective memory is classified into cultural memory and communicative memory where cultural memory has long term validity as it is based on ceremonial communication whereas communicative memory has short-term validity as it mostly consists of memories associated with fellow humans which fades with their death (Assmann, 1995). Culture functions as the principal provider of identity and meaning as it frames the collective memory of the society, forming the base for social order. Cultural heritage in many ways functions as the carrier of collective memory which involves both intangible and tangible heritage. Visual heritage illustrates the relation between identity and remembering. Identity here is referred as the product of processes that have reached culmination through gradual development (Viswanath and Nishant, 2021). Narration of the experiences from the past to the present is transmitted through historical landmarks, libraries, heritage buildings along with systems of value, music, language, fables, myths, legal or political traditions (Odendahl & Peters, 2009).

Concept of Isovist

The concept of Isovist has its roots in both geography and architecture along with mathematics. The term 'Isovist' has been coined by Tandy. He elaborates this as the process of "taking away from the [architectural or landscape] site a permanent record of what would otherwise be dependent on either memory or upon an unwieldy number of annotated photographs'' (Tandy, 1967). However, (Davis & Benedikt, 2006) identified a repeatable process of constructing and measuring the visual fields which helped in formally adopting the concept of 'Isovist' in architecture. Similar visual concepts like "view-shed" have been illustrated by (Lynch, 1984). While on parallel grounds Gibson focused on "intervisibility" in computer topographic models (Gallagher, 1972). Both the concepts were based on the common denominators of landscape and urban geography.

The most important factor of Isovist definition is that it accommodates all the rays of light accessible to the viewer's eye radially. However, it is intuitive to assume that human vision's geometrical limits are confined to a cone as it is clearly observed in my studies that perception and vision are highly complex. The vision is physically monitored my body, head and eyes with a combination of dimensions at allows a broader visual sampling of the environment (Smardon, Palmer, & Felleman, 1986). Though the typical macular field has a high acuity region with 124° cone of vision while the low acuity area expands to over 170°; with the tilting of head, it increases to 230° and by the partial rotation of waist and shoulders combined with head and eye movement the cone of vision is increased to 300°. Understanding the above factors, the Isovist theory is accommodated with a holistic visual analysis by adopting 360° Isovists which is standardised in all the architectural analysis (Meilinger, 2012).

Case Study-Madurai

Madurai city is located at the southern part of India, in Tamil Nadu province. Madurai's planning characteristics strictly follow the Nandyavaratha model of planning where the entire city is drafted over an 8x8 grid plan. As Goddess Meenakshi's temple is nestled at the central core the city is drafted with five concentric pradakshina pathas or circumambulatory paths in the form of streets as prescribed for Shakti (worshipers of Goddess Durga) temple (see figure 1).

The innermost four plots are dedicated to the temple and the consecutive twelve plots are occupied by the nobles and royals while the successive twenty plots cater to common people residences and the outermost ring is inhabited by slaves or considered as gross space. Street hierarchy is strictly followed which accommodates three orders. The principal streets are considered as the first order of the streets which bisect through the city forming the main through fare. Circumambulatory streets are considered as the second order which are designed by offsetting the temple boundary while the third order consists of connecter streets that connect the first and second order of the streets.

Madurai exhibits an overlay of various layers of architectural styles in response to the diversified political administration during its evolution. The city's architecture reigns to colonial style from Dravidian style. But the city also showcases few remnants of Buddhism and Jainism built with sandstone and granite structures form third century B.C. However, the Pandiyan impressions can still be clearly observed in and around the temple complex. Of all the Pandiyan structures East gopuram is the most visually focused structure in response to its scale. This initiated the construction of three other gopurams marking the cardinal points.

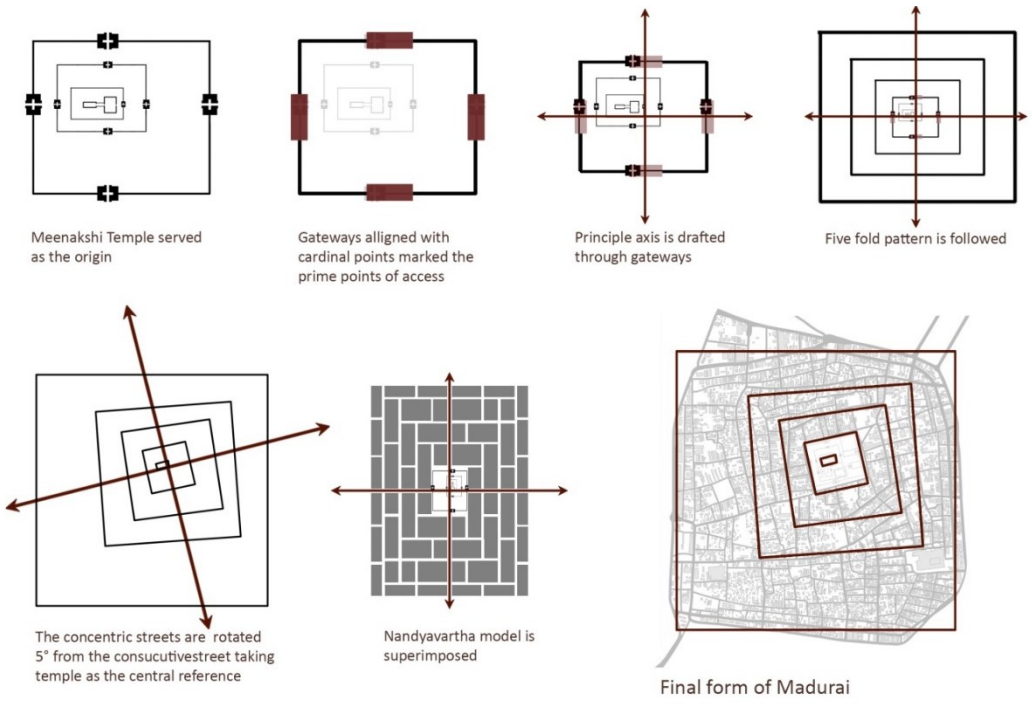

Figure 1: Planning attributes of Madurai, Source: Author

Data Collection

Spatial Data Collection

The spatial data is collected using online platforms and physical survey in the following ways:

a) Spatial mapping has been done with reference to Google maps, ArcGIS, and physical survey.
b) Building heights are referred from the concerned urban development authorities.
c) Land use pattern is drafted according to the physical survey and secondary data collected from published papers.

Visual Data Collection

a) The visual data has been documented in the following ways:
b) To analyse the visibility on the site the temple photographs have been taken from various points lying on the lines of visibility.
c) The street facades of both cardinal streets and circumambulatory streets have been visual documented using photographs and video as the medium.

Survey

The objective of the study is to find out the users' images and perceptions related to the temple town of Madurai experienced in different frames of time. To operate this study a questionnaire of city baric and user experience has been drafted and circulated through Microsoft forms. The questionnaire has a total of 14 questions out of which 6 questions are subjective, 6 are objective and 2 are 5-point Likert scale. This helped analysing the people's orientation in a temple town of Madurai as well to understand how collective memories are shaped and preserved within a social bracket.

Analysis and results

3D Isovist

These identities where usually positioned at prime locations usually at the central core of the city with a strong visual connectivity. With increased urban growth the visual accessibility of these identities is heavily challenged. This scenario is highly equipped with issues of social binding as these identities are epitomes of strong historical narratives. As an attempt to analyse the visual urban proportions of the city the research initiates a visual tool that can generate a digital visual heat map with respect to the existing urban volumes.
The following process has been used to fabricate the 3D Isovist map:

a) Maps taken from ArcGIS.

b) Drafted in AutoCAD to scale.
c) The data of the building heights is taken from the respective municipal commission.
d) 3-dimensional model is generated using Rhino
e) Ladybug plugin of grasshopper is used (as 3d Isovist is not available, a plugin is designed/customised specially for my study) to generate view-shed map.

According to the figure 2, the visibility of Gopuram can be accessed only on the cardinal streets which are the prime connecters to the outer city and internal sanctum and highly used by the tourist and pilgrims while the concentric streets have partial which is mainly used by the town dwellers. This visual access of the gopuram in response to its massive scale and spatial planning of the town has a huge influence on the mental image of the user forming the prime identity of both the temple and the city

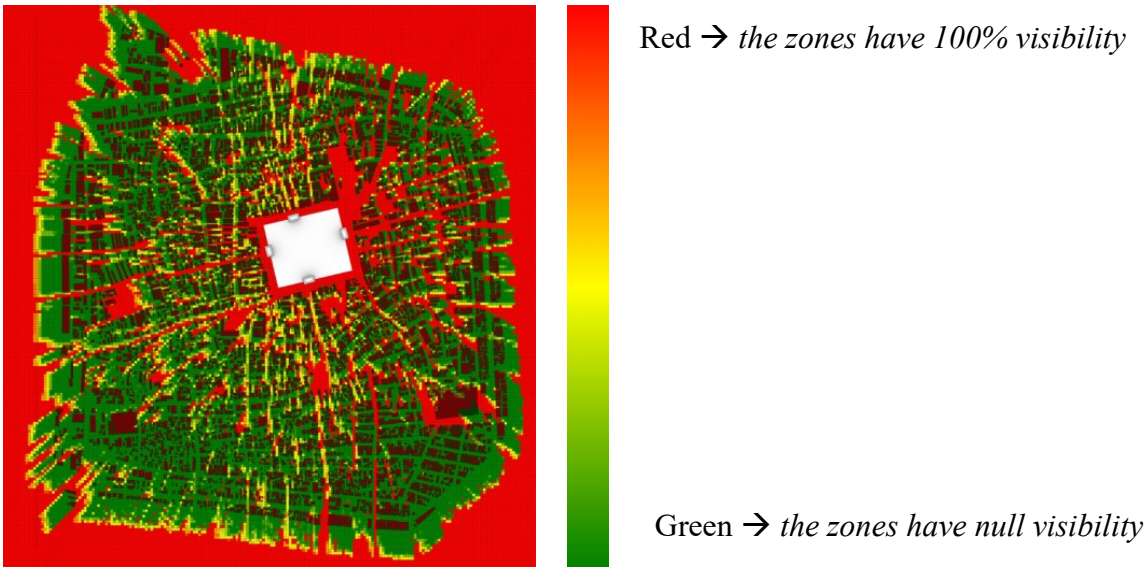

Figure 2: Madurai 3D Isovist map, (Developed by Author using Rhino software with Grasshopper plugin)

Mental Mapping

In this study the selected themes of observation are:
a) Hierarchy of the city characteristics according to the collective user preferences.
b) Factors responsible in forming the mental images of the users.
c) Different functions catered by the temple town.

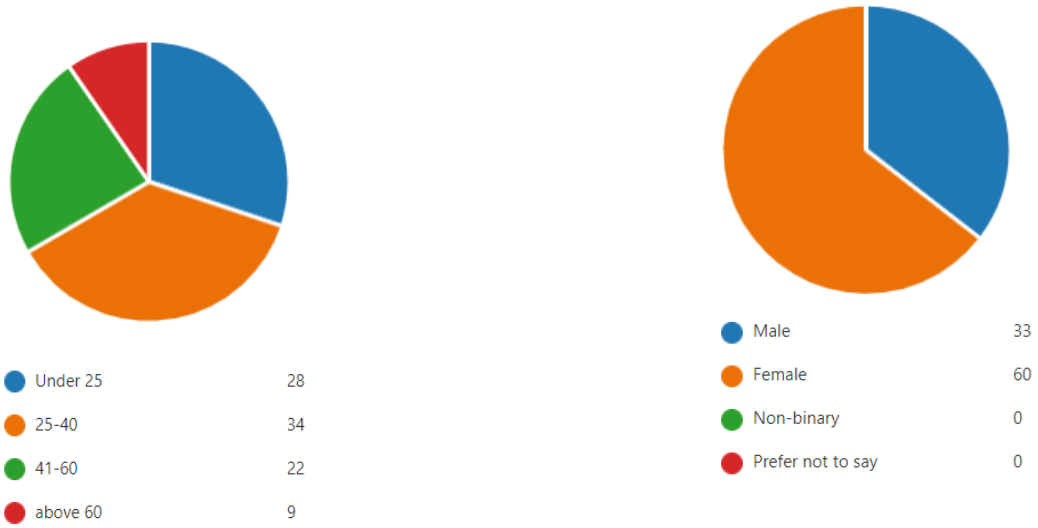

Figure 3: Categorizing of: (a) age groups and (b) gender participated in the survey (Developed by Author).

The sample consisted of questionnaire divided into four age-groups. Figure 3 indicates that, people belonging to age-group below 40 years are among most common visitors, out of which mostly are female.

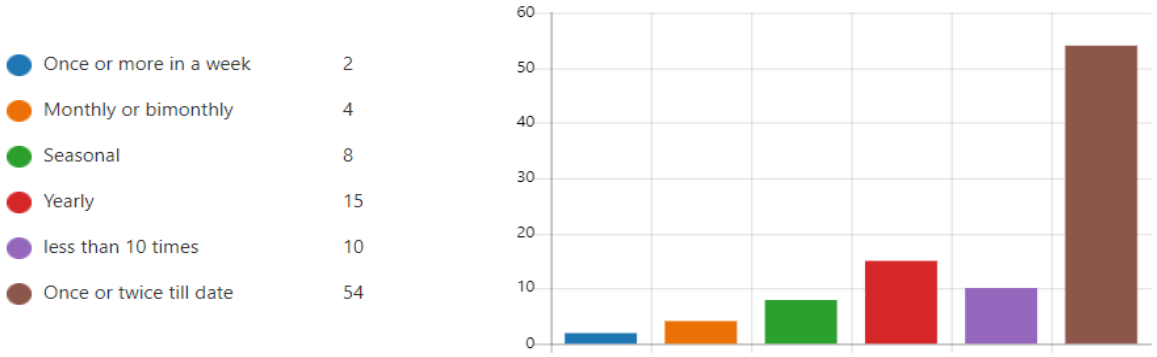

Figure 4: Bar chart showing the frequency of visit (Developed by Author).

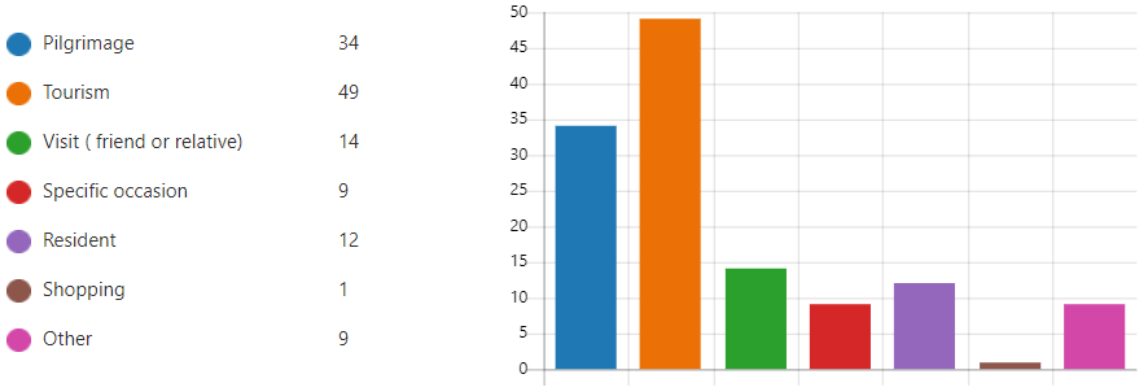

Figure 5: Bar chart showing the purpose of visit (Developed by Author).

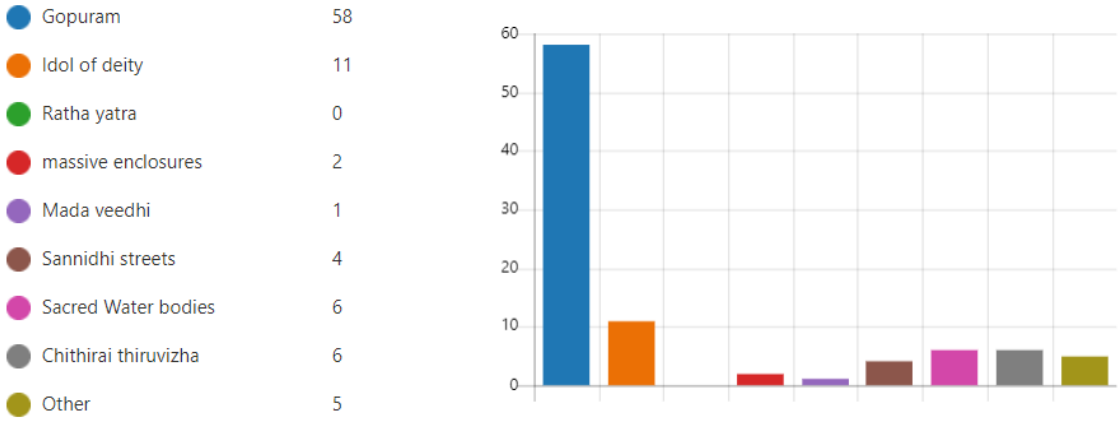

Figure 6: Bar chart showing 'first image that symbolizes Madurai' to the user (Developed by Author).

Figure 4 indicates that, the frequency of visit is mostly once or twice in a lifetime by the respondents. Figure 5 indicates that almost 75% of respondents visit Madurai city for either pilgrimage purpose or tourism purpose. Figure 6 indicates that, Gopuram stands as the 'first image that symbolizes Madurai' as an identity to most by the respondents.

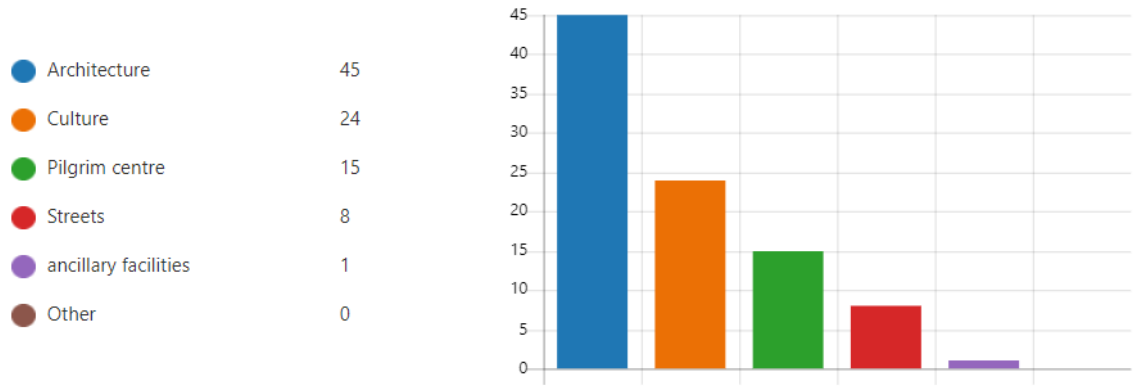

Figure 7: Bar chart showing 'most significant characteristic to the user (Developed by Author).

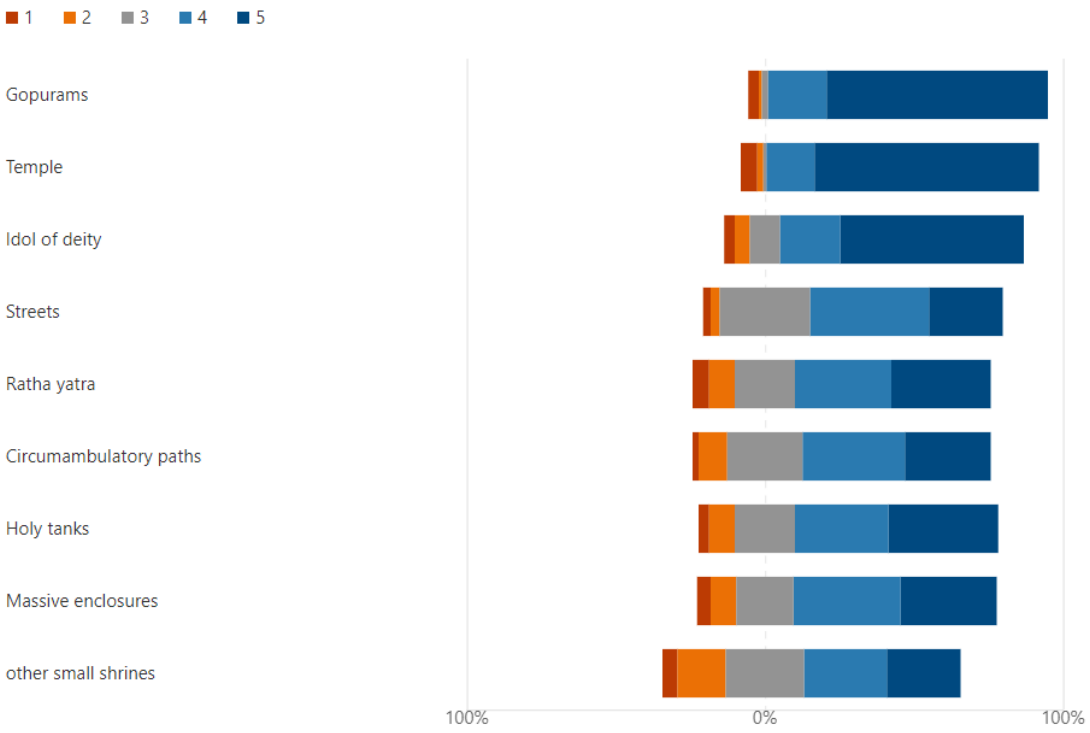

Figure 8: Likert chart showing 'On the scale of 1 to 5 how important is the factor of recognition of city elements' to the respondents (Developed by Author).

Figure 7 indicates that, architecture functions as the "most significant characteristic" for majority of the respondents. From figure 8, it was observed that both 'temple' and "Gopurams" were termed as most important factor of recognition of Madurai city by 75% of respondents and 61% of respondents responded that 'Idol of deity' is important factor of recognition of the city. While the respondents rated most of the factors above 4-point, figure 9 indicates that 90% of respondents felt that 'Vision of Gopuram' is one of the significant factors in the temple city of Madurai although the Likert chart exhibits that all the sensory factors play an important role in preserving the mental images of Madurai.

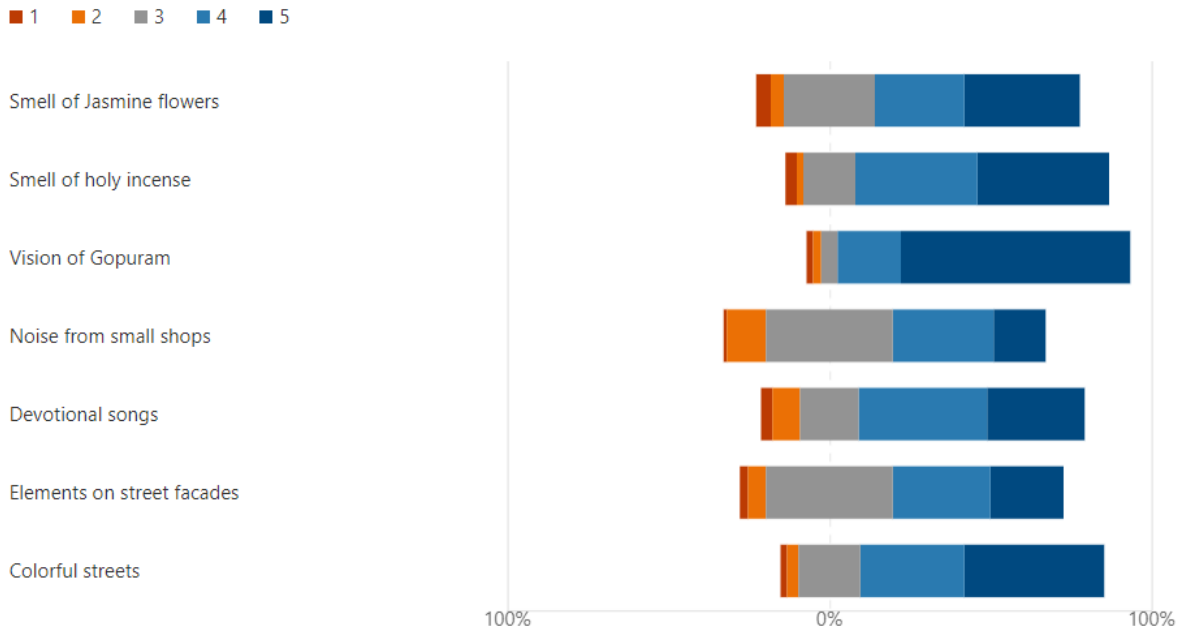

Figure 9: Likert chart showing 'how attractive are the sensory factors on the scale of 1 to 5 along the temple streets' to the user. Source: Primary survey (Author)

The responses to the sequential movement in the temple complex included the prime charecteristics of the temple along with details of the sensory factors. Sequential order is as follows:

a) Enter through Mottai Gopuram
b) Pray at Mottai Gopuram (gopuram is considered as a place of worship)
c) Collect Vibuthi (sacred ash smeared on the forehead)
d) Circumabulation around Potramarai (sacred water tank),
e) Visit Mukkurini Pillayar (small shrine of Lord Ganesha also the son of prime deity of Madurai)
f) Visit Sendooran Anjaneya (small shrine of Lord hanuman)
g) Go to Amman Sannidhi (main shrine of Goddess)
h) Then to Swami Sannidhi (main shrine of God)
i) Visit other small shrines like Siddhar and Durgai
j) Go to Maada Veedhi
k) Sit and relax listening to devotional songs.
l) Go to shopping.

Conclusions

Traditional views capes which once enjoyed the attention are now greatly threatened due to the rapid economic and social changes creating a visual decay in the historical core areas. Analysing the visual aspect of the traditional cities is a challenging task as the composition of the city fabric consists of multiple layers from different ages existing together. In case of these South Indian temple towns, the sections of the towns continually reveal themselves, as the towns were constructed over a longer period in the history and witnessed overlapping of distinctive cultures. Thus, from the above study it is understood that visual art and heritage is one of the important factors in preserving the imageability of the city as well as building strong connections of identity. Along with the visual factor, culture and traditions also support in maintaining the city's identity. The developments of the historical core post-independence in both spatial and volumetric domain has not given much significance towards preserving its identity in response to the rapid urban change and lack of awareness which led to the decay in the imageability to a great extent.

Imageability is the most dominant concept as it connects the people to its environment. Therefore, one of the major goals of the city planning is to enhance aesthetics of the temple town through proper urban design policies that aims in preserving the imageability in a holistic way. It is very important to include design policies based on three-dimensional visual image of the city with inclination towards the relationship between built form and its context. There is a dire need in understanding the strategies used for formulating these traditional cities in order to incorporate them into the planning of modern city fabric.

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Conflict of Interests

The author declares no conflict of interest.

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