

Evolving Process of Application of Methodology for Visual Perception of Urban Place: Case Study of Kolkata

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Abstract Vision is the most dominant sense for human beings. Visual perception has a substantial bearing on cognition, impression and importance of an urban place. Along with infrastructural needs, appropriate perceptual quality of a place is of considerable significance. Especially in developing countries the short fall has been alarming as reported by McKinsey. In this context, the paper brings forth a methodological approach, integrating relevant disciplines. The disciplines of visual communication design and urban design focussing on the core areas of visual perception and urban place respectively, have been analyzed. Though there have been overlaps in literary context, a holistic methodology has not been hitherto considered in unison. The various inter-relationships have been unearthed and a logical interpretation of its applicability has been adjudged in this ongoing research. Assorted urban places of city of Kolkata has been considered for analysis, however the findings of the paper is an endeavour to evolve the holistic methodology, generic in nature.

Keywords Visual perception · Urban place · Visual communication design · Urban design · Place making · Urban development · Environmental design · Imageability

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1 Introduction

Vision being the most dominant sense for human beings, it provides more information than the other senses combined. Orientation in space is achieved visually. **Visual Perception** is the process of registering visual sensory stimuli as meaningful experience. “A perceptual approach to visual communication” delves into the mechanism of processes of vision and how those forms attitudes and ideas [1]. Visual Communication design (VCD) is both the process and product, predominantly in visual media, which conveys intended information comprehensively; often it is produced through industrial means. It has targeted audience to cater to effectively.

Space is the physical manifestation of a location, whereas a place contains higher level aspects. Montgomery’s research sheds light on formation of **Urban Place** amongst space. According to him urban places are constructed by the physical form, activity and meaning [2]. Meaning generate perception and that is associated with individual’s internal psychological and social processes [3, 4] that generate perception [2]. Urban Design (UD) is the art of place making, associated with its arrangement, appearance and function. Like VCD, it is both the process and outcome. People create urban places, and eventually they themselves get influenced by those places [5]. In contemporary perspective, visual perception of urban place has substantial importance due to the following five aspects:

- It acts as a strong “image building” parameter; often serves as a continuum in restoring “historical, cultural and community background” of the place [2].
- It creates a specific character or trait of the place; forms a recognizable feature of the place, makes it “attractive or unattractive in comparison to another” [6].
- It is a proponent of commercial developments; “higher rental levels, enhanced regeneration, increased public support for development” [7].
- It creates aesthetically “pleasing ambience” and positive stress-free psychological effect, invites “community interaction”, participation and commerce [8].
- It directly or indirectly affects “developments, investments, occupancy levels, planning and design” [7].

Kolkata, like many other cities in developing countries, lacks a holistic methodology of design for visual perception of urban places. They often develop in a sporadic and subjective manner, eventually taking up a gruesome shape. McKinsey reports in 2010, major deficiency in Indian metropolitan and urban developments, with no mention of urban form or design to create a unique visual feel and to build the city’s character [9]. Kolkata is no exception. Numerous urban places face the same fate in India.

In present context, Visual Perception of Urban Places of Kolkata is getting importance in the light of urban transformation and changing political scenario. Kolkata, is thriving to get a new perceptual quality to establish itself at par with other developed metropolitan cities in the world.

For good place making, the knowledge of visual perception and urban place should be considered simultaneously. In this paper, an attempt has been made to

understand the gap and establish the inter-relationship of these two subject matters pertaining to visual perception of urban place, hitherto practiced independently, i.e. VCD and UD. A holistic **methodology for visual perception of urban place** has been reputed embracing these two disciplines and its appropriateness for application.

It is important to understand that though UD has certain principles pertaining to perceptual parameters, the core subject area which deals with visual perception and communication of human beings is VCD. Hence a wholesome place making would rely on appropriate synthesis of both UD and VCD. Both of them are relatively nascent subjects areas, coined only in late twentieth century and little has been done to integrate them till date.

In present context of rapid urbanization and mindless interplay of market forces leading to chaotic environment, research is necessary to bridge the gap between these two disciplines. For wholesome and articulated urban environment they should act in unison. A holistic methodology has been evolved which hitherto ceased to exist or not egalitarian in nature.

2 A Methodological Approach

2.1 *Understanding the Gaps of VCD and UD: Literature Study*

In continuum to the previous discussion it is important to deep dive into understanding the methodology encompassing VCD and UD for visual perception of urban place. And there after indicate the process of its application relevant to a context. Kolkata metropolitan has been selected for case study of the research.

2.1.1 Visual Communication Design and Its Aspects

VCD could be defined as “the process of conceiving, programming, projecting and realizing visual communications that are usually produced through industrial means and are aimed at broadcasting specific messages to specific sectors of the public. This is done with a view towards creating an impact on the public’s knowledge, attitudes, or behaviour in an intended direction” [10].

It has evolved in the last 50 years only, as a professional discipline. Though graphic communication with specific objectives had formations since 25,000 years, it pedagogy vastly changed only recently with advancements ranging from cognitive psychology to marketing [10]. Until beginning of World War I, the conception of visual communication was entrusted to artists or printers. Often these professionals evolved from schools of art and crafts and indulged in usage of artistic ornamentation, playing with various forms of typefaces, styles and sizes, where typography took a back seat and ornamentation was of priority. However things started to change in nineteenth century. With the advent of Art Novaeu, along with

strong complexity of design, stylistic blend with higher visual order started evolving. VCD developed its essential components in the 1920s (Art Novaeu, Bauhaus, De Stijl). It then changed from artistic notions of creation to effective communication in the 1950s when new developments in psychology, sociology, linguistics, and marketing attracted the attention of designers. “Important areas connected to communication design are experimental psychology (studies of perception, learning, and behavior); social psychology (studies in cultural trends, statistics, and behavior); research on perception, communications, learning, and behavior for the armed forces; marketing research for advertising agencies and consumer products manufacturers; and research in linguistics, rhetoric, and semiotics” [10]. This clearly indicates an essential feature of VCD considering inter-disciplinary, evolutionary nature of the same.

Now it is witnessing the next stage, based on developments in technology, which enhances interaction between the public and information. Also with the rise of consumerism and globalization, it is becoming more versatile and appreciated. People are becoming aware of and interactive to this easily discernible visual form into almost everything they see or visually encounter. VCD covers four basic areas based on nature of expertise, function and objectivity: namely, Design for information, Design for persuasion, Design for education, and Design for administration.

Design for information primarily aims at categories of design where dissipation of information is of prime importance [10]. While information design consists of two fold steps, organization of the information, then planning of its visual manifestation, design for persuasion is directed towards affecting behavior. It could be further subdivided into three areas namely, “advertising (commercial and non-commercial); propaganda (political and ideological); and social interest communications” [10]. These designs strongly get influenced by trends of globalization, consumerism unlike design for education which also has an impact on behavior but in a subtle manner. It is somewhere between information and persuasion. The active participation of the users of educational materials is central in this case. “Design for administration is a category all its own. It does not involve information, persuasion, or education, as the previous cases do, but it contributes to the organization of certain communications inside administrative systems” [10]. It is noteworthy, that essentially VCD relies on two elements: typography and image. Again, images can be representational or abstract in nature.

2.1.2 Urban Design and Its Aspects

City Beautiful Movement had a bearing on the then limited approaches of civic design, which was primarily concerned with orientation and design major civic buildings and their relationship with open spaces. Urban design evolved from this initial concept of building masses and space in between buildings to more expansive approach. It imbibed the qualities of physical and socio-cultural attribute of places affecting people. “It includes the way places work and matters such as community safety, as well as how they look. It concerns the connections between

people and places, movement and urban form, nature and the built fabric, and the processes for ensuring successful villages, towns and cities” [11].

“Urban design is concerned with the arrangement, appearance and function of our suburbs, towns and cities. It is both a process and an outcome of creating localities in which people live, engage with each other, and the physical place around them. Urban design involves many different disciplines Urban design operates from the macro scale of the urban structure (planning, zoning, transport and infrastructure networks) to the micro scale of street furniture and lighting” [12].

Though the term Urban Design as it is referred today ceased to exist before 1965, urbanization and urban design has been an intrinsic part of human civilization. Man started taking his first step towards urbanization when the Paleolithic man started making first shelters forsaking caves; followed by Neolithic man envisaging on agrarian population, protecting surplus resources and villages. With civilizations passing over ages, we have witnessed growth of buildings and cities. Urban developments have been formed as a functional core to lavish ostentations. From picturesque Baroque city to congested industrial ghettos the tale of the cities has been similar, until George Perkins Marsh introduced the concept of ecology. Olmsted took a leading role to bring out the new thinking process into city design. It has embraced newer agenda in twenty first century, aligning to inclusive design, neo-urbanism, sustainability and technology, along with integrative professional activity, interdisciplinary in nature.

“Kevin Lynch (1918–1984) was the first author who focused his work on visual elements and cognitive concepts of the urban environment” [13]. Lynch’s notion of mental image of the city was a macro level classification based on following five aspects: District, Edge, Pathway, Node and Landmark.

In a similar perspective, Gordon Cullen developed another concept of the mental image of a city, through observation of various urban places and elements, these are: Serial Vision, Place and Content. Speriregen constructed the skeletal framework at a greater granular level comprising of: Landform and nature, Local climate, Size, Shape, Pattern, Density, Grain and Texture, Districts, Routes, Activity Structure, Urban Spaces and Open Spaces, Built Form, Vista and Skyline, Orientation, Details and Non-physical Aspects [14]. While Lynch, Cullen and other authors have talked about visual concepts and imageability at a generic level, Speriregen, mentioned the micro-level elements.

During discussion of these aspects of UD, he has referred to elements several times, predominantly visual communicational in nature. These have special connotation with regards to visual perception of urban place. He pointed about signs, advertisements, paving, night lighting, materials, greenery, colors along with building form and density during discussing on appearance of District. He has further indicated in his findings, “a visual survey of urban details should, therefore, include sign studies. More broadly, it includes quality and conditions of park benches, wastebaskets, streetlamps, pavements, curbs, trees, fences, doorways, shop windows, etc.—the street furniture and hardware of the city” [14]. In another place he has aptly pointed out the usage of trees as an effective visual treatment and sidewalks being adorned with displays, cafes, kiosks or simply a place to seat

as a part of the ‘scene’. While describing programs he has mentioned about illumination as ‘untapped reservoirs of modern urban possibility’, street furniture, street hardware emphasizing on advertising, urban sculpture and art and landscape [14].

2.1.3 Aspects of VCD and Aspects of UD and Kolkata

One of the core objectives of UD is concerned with the appearance of a place. Also from the preceding literature study it is understood various forms of VCD are prevalent in visual regime of urban places affecting its appearance. Hence it is established that there exists relationship between VCD and UD, so far as visual perception of urban place is concerned, which directly or indirectly affects urban development and good place making. This paper unravels a remarkable aspect in this context of the inter-relationship of VCD and UD which has not been documented before. The Rhizomatic map of visual communication with various disciplines are shown in Fig. 1 [15]. The relationship of VCD with various other disciplines are conspicuously discernible, however, it is interesting to note that though it clearly connects up with Architecture and Engineering, Art alike, there is no existence of urban design in the diagram.

Again strongly inspecting the interdisciplinary nature of urban design, quoting Carmona “Urban design is not, however, simply an interface. It encompasses and sometimes subsumes a number of disciplines and activities” [7]. Hence it is expected that the relatively nascent discipline of UD should conjugate with various relevant domains and disciplines, including that of visual perception of place which directly correlates to appearance of a place. On scrutiny of Fig. 1, it reveals VCD has not yet been specified into the fabric of inter-disciplinary genre of UD, though ‘Art’ exists [16]. Today due to vast number of disciplinary specializations, urban design, needs to be egalitarian and holistic embracing the discipline related to appearance of urban place.

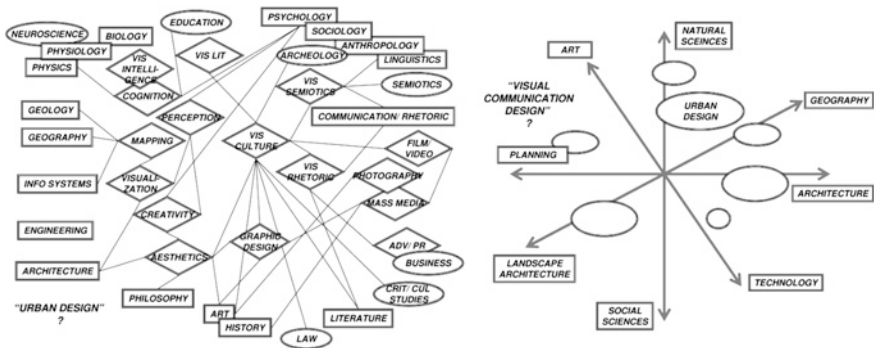


Fig. 1 A comparison of Rhizomatic map of visual communication and urban design with various disciplines. *Source* Smith et al. 2005 and Arida 2002 respectively [15, 16]

In context to urban development, VCD plays a pivotal role for visual communication of information, persuasion, administration and to some extent education, with direct usage such as Signages, Maps, Outdoor Advertisements, Banners, Posters, Graphics, Graphitti-Murals, Displays (print/digital/physical), Kiosks, Propaganda, Social Interest, Branding of a place or city etc. These are influential features so far as visual perception of urban place is concerned. However, these two disciplines lack integrated approach.

Paper published by Ghosh, Nag and Roy declares this context with Kolkata as case example study and case application study. It reveals substantial lacuna in some important places of Kolkata metropolitan, at the urban nodes aligned north-south, namely, Dumdum, Shyambazar, Esplanade, Hazra and Tollygunge. Though the city has propagated aspects of UD to some extent, it lacks cohesion with aspects of VCD. The pitfalls have been visually identified as against aspects of VCD such as lack of proper signage and its hierarchy, chaotic advertisement banners, lack of identity or congruent visual features of places, cluttered and non-coherent street furniture or hardware including hutments, slums and temporary shelters etc. Though some beatification efforts have been made but they are devoid of visual rationale and specification [17].

2.2 Establishing Inter-Relationships of VCD and UD: Evolving the Methodology

From the preceding discussions, it is clearly discernible that there exists a strong relationship between VCD and UD hitherto unattended. Now to objectively scrutinize the inter-relationship and derive at a methodology based on the literature study, a pilot survey has been conducted. The survey was crafted to validate the hypothetical literature findings. Moreover this hints towards various parameters which could be utilized by the methodology of visual perception of urban place. An online survey was conducted with 8 questions, each rated on a Likert scale, randomly posed to audience unrestricted to any geography. The questions were based on literature study, and Kolkata being considered as a case example. 111 responses were received out of which 6 were disqualified. The respondents were mostly of middle or high income group, with varied age groups, 33 % being female respondents. The respondents include both layman and people with prior education on various forms of design and aesthetics, also including people with experience of visiting or residing in one or more cities of developed nations. Such a mixed group has been chosen to analyze the variability of data based on variability of perception, experience and culture. Interestingly the data hints similar patterns irrespective of respondents' variability. It is evident from the survey, as shown in Fig. 2, that apart from buildings, various other elements of UD (U_E) such as signage, advertising, street furniture etc. play a key role for visual perception of a place.

Again, 84 % respondents relate the four areas of VCD (V_A) to appearance of urban place, followed by its function and arrangement. Hence, the appearance of

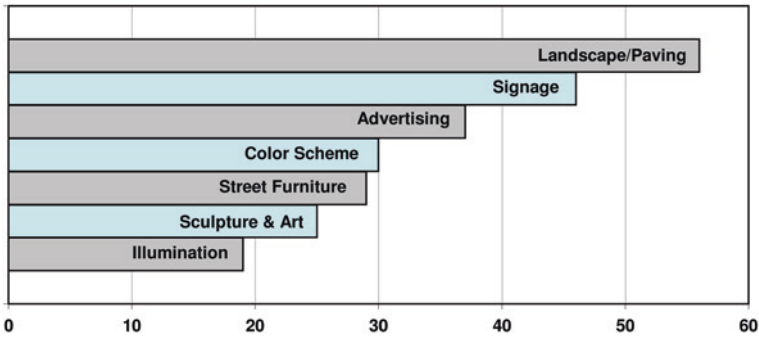


Fig. 2 Priority of U_E for visually perceiving urban place (x: %, y: U_E)

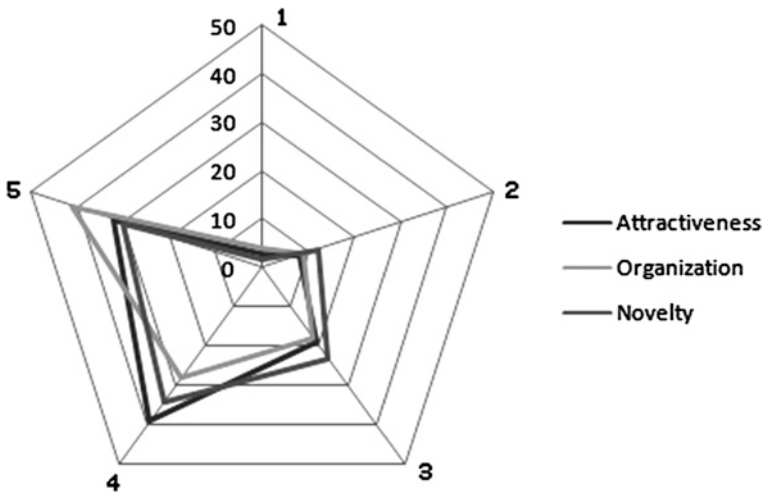


Fig. 3 Rating of P_Q of visually perceived urban place (% values mentioned)

the place is intrinsically affected by various artifacts from various areas of VCD which again has an overlap with U_E . Putting a parametric dimension to the findings, the authors propose the dimensions of people’s impression of a place in terms of attractiveness, organization and novelty (P_Q). Though Ernawati’s research on these attributes (P_Q) have been targeted towards tourist-historic districts, it could be well adopted for urban places [18]. Survey indicates people relate to P_Q strongly so far as visual perception of urban place is concerned as shown in Fig. 3 where 1 is Strongly Disagree and 5 is Strongly Agree.

Based on these findings and validations, the inter-relationship between VCD and UD for visual perception of urban place has been proposed as depicted in Fig. 4, which eventually leads to the formulation of the methodology addressing the parameters identified therein.

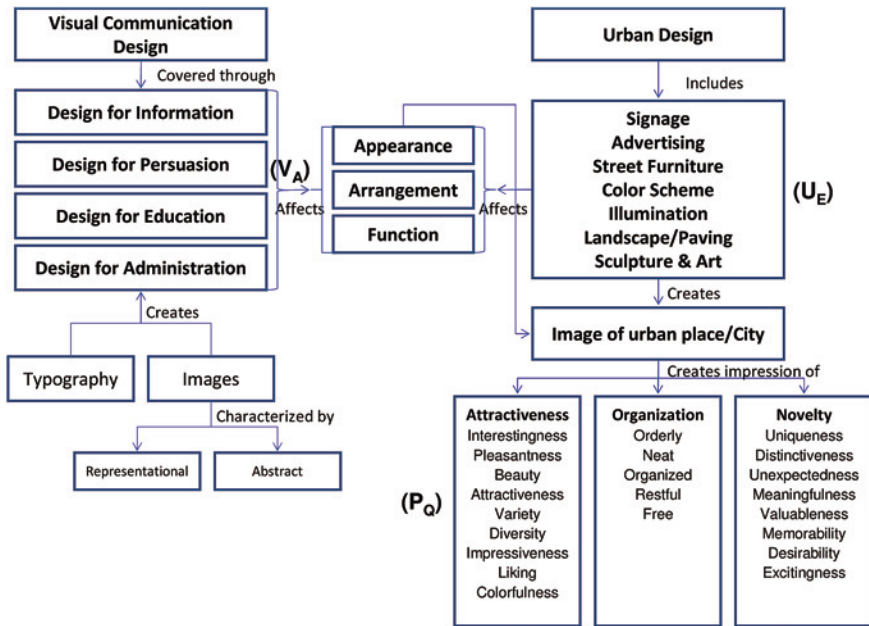


Fig. 4 Relationship of aspects of VCD and UD used for evolving the methodology for visual perception of urban place

Based on the above inter-relationship a methodology of visual perception of urban place has been derived as shown in Fig. 5. It is important to note, that based on the discussion earlier such a methodology or tool would come handy generating non-conventional approaches of assessing, designing, regenerating urban places. It may serve as an effective instrument of visual perception of urban place related to environmental design, aesthetics, identity building, imageability etc. which is a holistic blend of VCD (V_A) and UD (U_E) on one hand and parametric on measurable grounds (P_Q) on the other.

2.3 Evolving the Process of Application of the Methodology

To apply the thus evolved methodology, the relationship of U_E and P_Q needs to be objectively analyzed, though in previous Figs. (2 and 3) individual characteristics of U_E and P_Q could be understood. Graph in Fig. 6 shows importance of P_Q against each U_E based on the Likert scores (1 = Very unimportant, 5 = Very important). The gross pattern is similar agnostic of Likert scores. Now, the weight of attractiveness, organization and novelty (constituents of P_Q) have been found to be close, 0.99, 1 and 0.96 respectively. Hence to apply this methodology based on the case application, equal importance of these factors with respect to U_E to

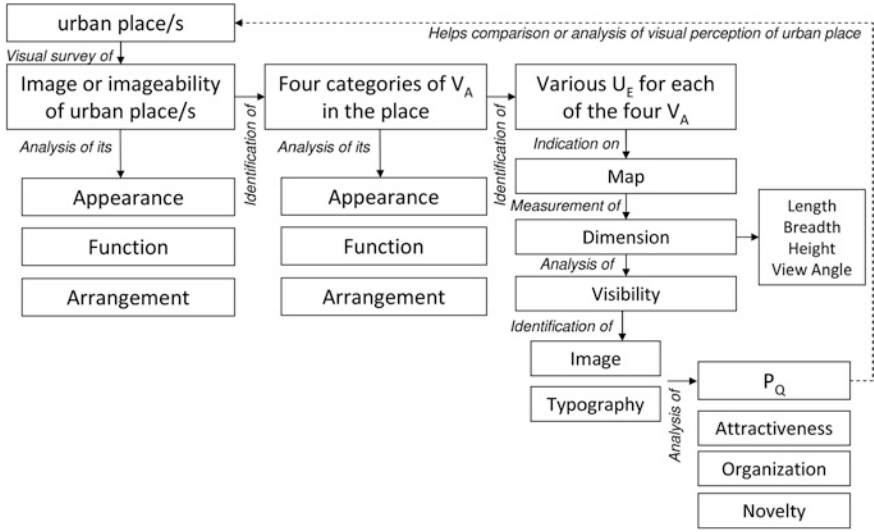


Fig. 5 Evolving a methodology for visual perception of urban place

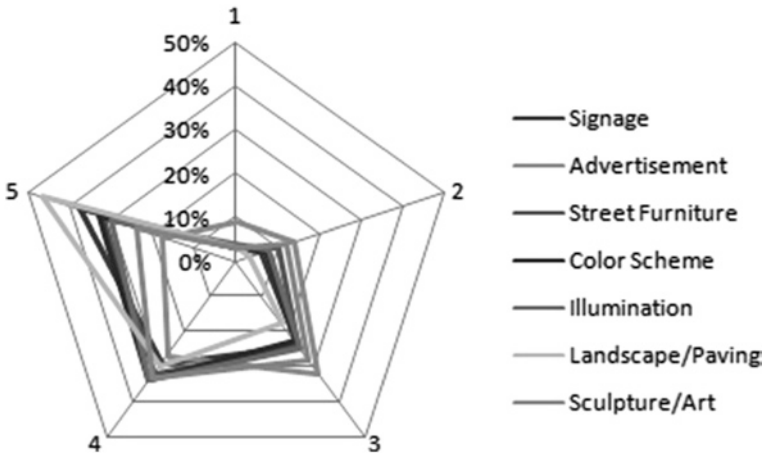


Fig. 6 U_E rated against P_Q

be considered. However precise ordering indicates ‘organization’ to be of higher weight followed by attractiveness and novelty. As shown in Fig. 4 P_Q is parameterized into 22 factors, under three broad heads. These factors need to be taken into account for particular case application.

Again, for the application of the methodology, the parameters of each U_E pertaining to various V_A needs to be investigated. The substantial overlap of U_E and V_A establishes the very conception of this research. Literature study indicates VCD

V _A	U _E	P _Q →	Attractiveness (P _{QA})					Organization (P _{QO})					Novelty (P _{QN})		
			Interestingness	Pleasantness	Beauty	Attractiveness	Variety...	Orderly	Neat	Organized	Restful	Free	Uniqueness	Distinctiveness ...	
Design for Information	Signage	Image	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5
		Type	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5
	Maps	Image	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5
		Type	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5
Design for Persuasion	Advertisement	Image	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5
		Type	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5
	...	Image	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5
		Type	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5	1-2-3-4-5
Design for Education	...														
Design for Admin	...														

Fig. 7 Survey format derived from the evolved methodology as a process of application of methodology for visual perception of urban place

relies on images and typography as its constituents. It is interesting to note, this research brings forth, so far as visual perception of urban place is concerned, visual communication is possible through elements, which compositionally do not constitute of typography and image, i.e. Landscape/Paving (76 %) and color shceme (72 %) followed by street furniture (60 %), illumination (56 %) and art/sculpture (56 %) as shown in Fig. 2. These elements constitute majorly to the image of a place or scene rather than constitution of a VCD elements in singularity. Based on this discussion, a process of application of the methodology has been evolved. A matrix as shown in Fig. 7 has been crafted to examine the applicability of the methodology, which would be applied at some of the urban places of Kolkata.

Kolkata has seen its rise from conglomeration of villages into a colonial town. It served as the glorified capital of the nation giving way to various anomalies post independence. It has seen a diverse interplay of culture and socio-economic variations. Along with British colonial squares there exists slums, vernacular mansions, congested shopping areas alike. Similar to most of the cities in developing nations, places have evolved with no visual perception kept in mind. Morphologically Kolkata is a linear city stretching north-south. Major arterial roads are aligned accordingly. Important urban places evolved over course of time at various nodes of these roads. Considering the diverse visual and cultural characteristics of Kolkata, along with fundamentally potential place make-over tendency, several important nodes (places) has been identified for application of this methodology. As an ongoing research, an initial visual survey as indicated in the methodology (Fig. 5) has been conducted which brings out crucial observation in support to the applicability of the methodology. Figure 8 indicates V_A and its issues for four different urban places of Kolkata. □, ○, △ and + markers are used to indicate issues pertaining to V_A, namely, design for information, persuasion, administration and education, respectively. The process of application of methodology in context to Kolkata as both case example and case application study, has been used as a precursor for



Fig. 8 Adjudging the process of application of methodology in context to visual perception urban places of Kolkata

further data gathering and its analysis, as part of an ongoing research endeavour. However a holistic attempt has been made bridging VCD and UD in a parametric way, deriving a methodology and herewith adjudge it process of applicability.

3 Conclusion

Conventional place making approach often lacks disciplinary cohesion of VCD with UD. The deficiency has already been discussed in detail as pointed out by McKinsey's report. Along with lack of a holistic, inter-disciplinary and integrated approach, many cities of the developing nations are often subjected to urban development, environmental design and regeneration models without proper tools and course of action. Based on the ongoing research endeavor, the paper evolved a process of application of methodology for visual perception of urban place. We visually perceive the environment around us, and it affects our actions, reactions and feelings. Urban places are juxtaposed, with innumerable visual elements and treatments, often developed without any holistic planning over course of time. It often has perceptual inappropriateness and complexity. It is at par with basic infrastructural qualities of a city. Also it has been found that visual perception has a strong influence on urban development and commercial aspects. Hence, application of the methodology in urban paradigm would lead to promising findings and implementations towards better place making. The approach of the research is twofold to evolve the methodology and its process of application and thereafter adjudge the data gathered through them. Hence this paper based on research work in progress, is directed towards the theoretical base or the process of the empirical data gathering. Future studies in direction holds immense possibilities of knitting place perception and environmental design with enhanced interaction, interface, robotics, sustainability etc.

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