BEHAVIOUR IN SPACES

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Dedicated to my dearest friend of more then 50 years

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1   HUMAN BEHAVIOUR

EVIDENCE OF HUMAN BEHAVIOUR

Human behaviour is evident in responses related to Four elements: Body, Environment, Space and the Occupants. A response is defined as: *reflex action-reaction, rebound, consequence, outcome or acknowledgement.* Responses, whether *automatic or voluntary, instinctive or intentional, and conscious or subconscious,* show up in some form of change: the behaviour.

The human behaviour takes many forms. It is seen as conspicuous actions through body-limb movements or postures, discreet expressions of body related gestures, and also as overt expressions in modes like speaking, writings, painting, etc. Some forms of human behaviour are less discernible because they are only occasional and occur in small measures. Biological changes reflect accumulated effect of such occasional and small changes.

> Human behaviour is also conveyed through art, and spoken or written language. The fear, pain, love, affection, joy, wonderment, admiration, hatred, etc., are intense emotions, that are expressed through art or language. Perhaps physiological tools (body-limb movements and other body language expressions) are too slow, inadequate for the purpose, useless for the need, or unavailable (due to physical disability, age, sex limitations, etc.). Expression on media is much longer lasting, and so unlikely to be misinterpreted.

Human behaviour originates from the genetic make up and is further conditioned by the experiences. Experiences enrich one with productive efficiency. Appropriate behaviour allows a being to survive and proliferate, whereas inappropriate behaviour gradually makes a being extinct.

> Ancient philosophers called the human senses '*the windows of the soul*'. Aristotle has listed at least five senses: *seeing, hearing, smell, taste, and touch.* These definitions have persisted. However, a modern list includes many more senses. Human skin is now regarded as participating in perception of *hot, cold, pressure, and pain.* Other inclusions are; a kinesthetic sense (sense organs in muscles, tendons, and joints) and a sense of balance or equilibrium (so-called vestibular organs of the inner ear stimulated by gravity and acceleration). There are receptors within the circulatory system that are sensitive to carbon dioxide gas in the blood or to changes in blood

pressure. Similarly receptors in the digestive tract appear to mediate experiences as hunger and thirst.

Not all receptors give rise to *direct sensory awareness*; circulatory (cardiovascular) receptors function largely in reflexes that adjust the blood pressure or heart rate without the person being conscious of them. Though perceptible as hunger pangs, feelings of hunger are not exclusively mediated by the gastric (stomach) receptors. Some brain cells may also participate as "hunger" receptors. This is especially true of cells in the lower parts of the brain (such as the hypothalamus) where some cells have been found to be sensitive to changes in blood chemistry (water and other products of digestion) and even to changes in temperature within the brain itself.

BEHAVIOURAL RESPONSES

Behavioural responses can be broadly categorized as:

1   BODY related responses

2   ENVIRONMENT associated responses

3   SPACE responses

4   OCCUPANTS reactions

1   BODY related responses

Responses of the body can be categorised as:

> Responses of the Functional systems such as a metabolism, neural transmission, etc.,

> Responses resulting from Cognitive capacities that determine what we perceive and so respond.

> Responses due to the 'Reach' abilities of the limbs. These determine what we can change in the immediate environment. Such responses are personal or individual, but because of the common genetic make-up there are some common features.

Body related responses are in the form of gestures and postures and how one positions the body.

Gestures are micro responses that may not be apparent unless very keenly observed. Gestures are very economic and effective means of expression. Gestures also constitute supplementary vocabulary for communication.

Postures are macro responses of the body. These postures are chiefly tasks related, so are intentional. Though some of the involuntary reflexes resulting from the body systems such as mental processes, metabolism, equilibrium maintenance, body temperature and fluid controls, etc. are both gestures and postures (macro and micro). Postures often need the supplement like amenities and facilities for sustenance. Productive efficiency is the key factor for posturing, and for that reason we accomplish diverse tasks within a posture or conduct same task in different postures.

> Amenities are attached to architectonic elements and are relocatable, whereas Facilities are integrated architectural configurations and are mostly fixed but sometimes demountable. (More in chapter 13 Amenities and facilities).

Positioning is used to place and orient appropriately own-self in a space. It is often in anticipation of an event to develop, so the response seems impulsive, but is calculative. There is an acknowledgement what that event would mean personally. It is also defensive, offensive, declarative or confirming.

Positioning is Micro, when body is re-postured, reoriented or the 'reach' in space is modified. However, at Macro level, one becomes dynamic and shifts the location. Repositioning is also achieved by changing the means of expression and communication.

Positioning makes use of space, environmental and other occupants to establish paradigm behaviour. The positioning behaviour is for occupation, possession, survival and proliferation.

2   ENVIRONMENT associated responses

Environment is the supportive system that moulds our perception and commands the responses. Environment and cognition are coincident, and one cannot be realized without the other. We handle the environment by

interpretation, evaluation, operation, and response. Environment is not realized as one incident effect, but as it poses accumulated and ever evolving repertory of responses. Environmental responses form a process of becoming aware of a space. Environment formats a life style that passes on from one generation to another as ethnicity or custom. Environment also includes real presence of other occupants.

> The environment is the surroundings or condition in which a person, animal, or plant lives or operates, and experience objects. Some aspects of environment have predictable periodicity (light, seasons, etc.) whereas other are unpredictable (wind, rain, etc.). Environment is ever evolving *and the* occupant or the users respond with different levels or receptivity.

> The environment is conditioned at many different levels. The first conditioning of the environment is at a local level. Human body adopts itself to the environment. Then clothing provides the cover. The natural entities like trees, caves, valleys, gorges, etc. also provide the containment. Built-spaces and the installed facilities regulate the environment. At another level beliefs, feelings and experiences help overcome the apprehensions, and thereby master the environment.

3 SPACE responses

Space is the setting where environment and cognition actualize concurrently. Environment is continually variable and so a space experience is ever expounding. Space experience is one major factor that governs the nature of cognition. As cognition is individual, it endows environment subjective significance. The space has a unique relevance to the occupant. It continues to reveal differently in spite of its scale or spatial features remaining static. Some environmental conditions and spatial features often occur in concert. And so we expect the presence of one to trigger the other. Space is the setting where human behaviour responses show both consistency and change. The space is the setting or realm of conditions in which a particular activity is carried on.

Environment permeates into a space depending on the spatial characteristics, such as the size, shape, sequencing, quality of barriers, etc. The changes in environment affect the space as much as its inhabitants. An individual perceives the environment and the characteristics of the space, collectively, as

a singular happening. This perception is further coloured by beliefs, metaphors, and group behaviour dynamics. The accommodation of environmental changes makes the process of inhabitation tougher, but always equips one with better skills and greater efficiencies.

4 OCCUPANTS reactions

Occupants of a space are real, and sometimes through the metaphoric presence. Behaviour responses occur due to both types of occupants. In this sense co-occupants are part of the environment with whom we react and are affected by their 'presence'. A social acquaintanceship with anyone is not a necessary condition to respond. Behaviour responses are due to the biological needs and also for cultural reasons or social norms. Our responses with other beings and social interactions regulate *what we share and empathise*. Responses with other occupants depend on the awareness about *sex, age, stature, need, social position, degree of familiarity, distance and recognition* (through cognition). Metaphoric presence of others is reinforced primally by the historical context (what we have been told or learnt) and associations. Metaphoric presence is also enhanced by space and objects, as well as by other occupants confirmative or even rejective (empathetic, sympathetic or apathetic) behaviour.

Human behaviour is conditioned by three major factors:

> Personal factors, such as the Cognition system, Metabolism, Past experiences, etc.
> Presence and awareness of other human beings, such as in certain sociological responses.
> Contextual conditions, such as with the space and environment that support the cognition system, and which in turn mould our perception and responses.

Our perception of things and happenings around us results from our cognitive capacities and the physiological needs, but is also moulded by the inherited and learnt faculties. We perceive, become aware, and respond to the environment around us and to other human beings. The space and the environment provide a supportive system to mould our perception and command the responses.

The responses that define the spectrum of human behaviour can be broadly categorised as:

1   Psychological responses involve the body (perception capacities), intuitive (inherited) and intellectual (learnt) faculties.

2   Physiological responses relate to survival, health, well being and comfort.

3   Sociological responses include 'group behaviour dynamics' and communication.

PSYCHOLOGICAL RESPONSES

We become aware of the environment around us, including spaces and other human beings. We respond to environment in many different ways. Responses to the environment are complex and best understood in terms of Three psychological stages of human behaviour: perception, cognition and the response mechanism.

Perception is a process of becoming aware through the sensations of sight, hearing, smell, touch and taste. Perception of the environment, in its most strict sense, refers to the process of becoming aware of a space.

Perception is an active process of selection, organization and interpretation of information about the world as conveyed by the senses and not a passive mirroring of the external world. Perceptual experience is also influenced by various internal factors, such as our prior experience and expectations.

Cognition is the mental processing by remembering, thinking about or evaluating the sensory information. It is further moulded by the inherited (intuitive) and learnt (intellectual) faculties.

Response mechanism is active, even as the perception and cognition are occurring. The responses could be: accommodation, adjustment (like acclimatisation), spatial shifting or temporal rescheduling, biological correction or degradation. All such physical changes reflect behaviour. These are often imperceptible, or so small that only the concentrated effects are perceived. The responses are also assisted by the supportive systems such as tools, implements, gadgets, equipments, etc. The human behaviour also results in response to many individual factors, such as the cognition system, metabolism, past experiences, etc.

PHYSIOLOGICAL RESPONSES

Physiological responses are basic to our survival. Physiological responses for survival are universal and seem to be instinctive because of the genetic makeup. However, individual behaviour is usually learnt. Accumulated experiences help us to respond specifically. The response mechanism or nature of behaviour varies due to individual factors like age, sex, level of adaptation, familiarity, limb capacity, body-limb coordination, sensorial abilities and supportive tools, etc. Our behaviour is also conditioned if the situations are consistent or extra ordinary.

Beyond the survival, physiological responses are directed for inhabitation. We create, occupy and flourish in spaces. Physiological responses allow spatial occupation with dimensional accommodation and fitment of the human-body. Physiological responses achieve task functionality by way of compliance within set confines for nominal to extreme purposes. Physiological responses to the environment develop both as historical and the current effects of the environment. The process of acclimatization is in way a physiological reaction. Physiological responses achieve both, stability and mobility necessary for efficiency, comfort and security.

SOCIOLOGICAL RESPONSES

The sociological implications of the human behaviour become more evident in the context of the environment, which in turn is formed by Space, Climate and Other beings. Behaviour (even of lone beings) is substantially in the context of 'awareness' of other human beings (and not necessarily the physical presence). Interpersonal relationships among members of small groups are a result of the personality and cultural backgrounds of the individuals involved, their tasks, and the nature of the spatial arrangements or physical settings. However, various cultures respond differently to the amount and arrangement of spaces.

The sociological determinants relate to the social needs of the occupants. Humans evaluate the acceptability or appropriateness of behaviour using social norms, and regulate it by means of social control. The Sociological responses of human behaviour relate to the social needs of the occupants and awareness of their implications. The space, environment and the occupants together foster a social-contact mechanism. Sociological responses include group mechanisms like intra personal communication, empathy, degree of familiarity, etc.

2   INHABITATION

POSSESSION OCCUPATION and INHABITATION

All beings show prime behaviour towards possessing a space. Such behaviour has an immediate function, of continuing the occupation -a tactic of perseveration, and an ensuing intention of effecting the inhabitation -a strategy of domesticating.

Possession and Occupation of a spatial entity are acts of inhabitation. These acts allow a person or a group of persons to establish a Role Locus (a stage or setting). A role locus is established by delineating a territory and then recognising it as a zone of effectuality. The territorial marking is a deliberate creation, whereas recognising the zone of effectuality could be both, conscious as well as subconscious action.

Inhabitation creates a personal realm. All living beings create a realm of their own to survive and proliferate. Inhabitation is instinctive as well as learned behaviour. The inhabitable realm is a spatial organization with an implicit environment. Both of these are simultaneously evident as substantial realization of functional utility. The functional utility is further 'enriched' by tools, gadgets, equipments, etc. The form, the environment, and the functional facilities, all together instill certain sensorial experiences. The sensorial gratification leads to improved form, superior conditioning of the environment and enriched functional facilities.

The process of inhabitation begins as realization and occupation of a realm. The inhabitation is an integrated approach of many interdependent elements, whose distinct identification is difficult. All beings have primarily a tactic (often instinctive) of occupying a spatial entity, which on sensorial gratification (including comfort) becomes a greater strategy (often intellectual) of inhabitation. The legacy of past experiences increases the capacity to occupy and inhabit a space entity. The reliance on intuition and the past experiences assures a 'failsafe' response.

Primary space occupation is cursory and minimal, using only the personal assets such as resetting of the bio-physiological activities. It is easier (being efficient) to adjust own-self rather than cause any change in the environment. However, the capacity to bio-adjust is temporary and limited in effect. Such a space occupation (through personal- bio adjustments) is experimental, so notional and transient. It only offers realization that the space is survival worthy, because it has some *potential of size, shape, environmental qualities and sensorial characteristics*. There is also recognition that this realm can be: *improvised in form, its environmental qualities reset, and the sensual characteristics enriched for satisfaction and greater efficiency*.

A person or a group may perceive such potential accidentally, or after an intensive search, and so consider it an asset worth *hanging-on* to. The desire to own a place, requires that it remain consistent. However, the environment and the user or the user-group dynamics (interrelationship) vary continually. The original efficiencies (first realizations) may not remain valid in such circumstances. Yet the possession ensures some permanency to the place. The constancy is achieved by domestication of the place. The user converts the place, and inturn exposes own-self to forces of change.

The space adaptation is an elaborate cycle, where the user and the space change each other. The change in one aspect poses new possibilities elsewhere. The explorative occupation of a space turns into a domesticated domain, and the process persists as inhabitation.

Place inhabitation is a matter of subsistence, so more considerate, realistic and longer lasting. Inhabitation involves devising means such as tools, equipments, plants, facilities, amenities, furniture and furnishings. The devices are handy tools, relocatable equipments, fixed plants, or systems integrated into the built forms. The devices help build a space entity, temper the environment, and endow task efficiencies by adjusting the 'reach' capacities.

Inhabitation is continuous process. The changes are often so subtle that the user may not be aware of it, yet over a period of time the minor changes accumulate to substantial modifications (like Charles Darwin theory of evolution).

Inhabitation is a continuous process of improvising the means and methods for living. It involves, forming a space (a built form) with environmental responses, rendering it with required sensorial attributes, provisioning for the functional needs of living. The living includes personal acts like grooming, eating, resting, etc., living with others (including family life), communication, earning a livelihood, and other diversionary activities like revelry, grief, etc. These activities are personal, family based, group-based and universal (of humans and of other biological beings).

Some of the processes of change for inhabitation are either instinctive or so imperative that such responses are taken for granted. Such responses also get condensed as metaphoric expressions or pass into the folklore or heritage.

A spatial entity is habited by a lone user as well as groups of related or unrelated people. A user reacts to the 'real presence' of others and also to the 'incorporeal imminence' (presence in spirit) of others.

In a holy space like temple one is affected by the presumed presence of God. Memorials are designed for causing the reverence. Burial grounds and crematoria cause an eerie feeling. Odours, lingering sounds, distant visibility, touch, etc. reinforces the presence of others at realistic level, as much as images, metaphors, signs and other associated items do so at the abstract level.

The interaction amongst the 'real' users in a space depends on the reach-capacities. A reach is measurable on two counts: Physical distance and Degree of sensorial perceptivity. The reach also bears on intensities of factors like desire, need, compulsion, aversion, instinct etc.

The physical reach is function of mobility, a capacity to move a limb of the body in a wide range of purposeful movements at the required speed. It dynamically helps one to activate as well as deactivate (relaxation) the limb. Physical reach is used in occupation and inhabitation of space. It is also used as means of expression and communication. The sensorial perceptivity represents the capacity to perceive through various senses. These capacities can become very acute or get dulled in specific conditions. The sensorial capacities can be enhanced by certain tools or recast in some other recognisable form (we do not 'see' deep into the celestial space, but rather listen to the noise emanating out it). (more on *'reach' in next chapter*).

There are many *'space and time'* conditions where and when the reach is not measurable. These create pseudo or make-believe circumstances where the real

dimensions of the reach are *shrunk, enlarged, skewed, delayed or hastened.* Pretentious reach can be experienced in reflections of mirrors (doubling of the depth and displacement of left-right), bifocal vision (perspectives, optical anomalies -long straight lines seem curved), echoes, in transmitted audio messages and images, condensed graphics, metaphoric and symbolical representations, holographic images, virtual reality conditions, etc.

The devices and strategies of habitation are evident at three distinct levels:

1 The User adopts own-self biologically,

2 The Environment is conditioned,

3 The Place is dimensioned and structured.

All three occur simultaneously. Users' responses in a space are mix of determinable as well as in-specifiable aspects. The behaviour in space (a domesticated domain) could be *local and immediate* (like going to a shaded area, changing a body posture, breathing deep before a strenuous action), to extensive and persistent (putting on a light, moving to another space, installing a sound proofing system). Behaviour in spaces is meaningful to all its inhabitants, but more so for Designers who can plan strategies and devise means for conditioning it.

3   PLACE IDENTITY

As a person marks, possesses and occupies a place for inhabitation it becomes a meaningful place. For the person, the geographical spread becomes a Role Locus for behaviour. The place identity leads to a place attachment, because here a person can satisfy biological, social, psychological and cultural needs. The experiences of inhabitation at a place create a legacy of personal values, attitudes, feelings and beliefs. As a person interacts with various places and spaces, one is able to evaluate which properties in different environmental conditions fulfill various needs. A place and space begin to merge as a complete form or setting to sustain the behaviour.

> Harold Proshansky, etc. of City University of New York have explored the concept of place identity as a *'substructure of the self-identity of the person consisting of broadly conceived cognition about the physical world in which the individual lives'*. Tuan (1980), Relph (1976) and Buttimer (1980), share a couple of basic assumptions. *As a person lives and creates memories within a place, attachment is built and it is through one's personal connection to a place, that he or she gains a sense of belonging and purpose, which then gives significance and meaning to their life.*

> 'There is reciprocal interaction between people and their physical environment; people affect places, and places (and the way places are affected) influence how people see themselves'.

> Casey (2001) states that identity is created both internally in the mind, and through the body's interaction with the outside world -there is no place without self, and no self without place.

THE LOCUS

The role locus is a setting or a realm for behaviour with many facets. It is a 'Space for inhabitation' [1], a 'Zone of individuality' [2] and also an entity existing in its 'Formal and allegorical or abstracted form' [3]. The role locus has the individual or a group leader as its focus. In this sense it is subjective.

1   The role locus is an inhabitable place. It is space defined by the bounding barriers. So it is a physical reality, a dimensioned territorial entity. It is a non-transient location. It is finite in scale, sized and shaped for the occupant. It also reflects the cognitive capacities and 'reach capacities' of the occupant.

2   As a zone of an individuality, it has a personal imprint or relevance. It has associated beliefs, intuition, etc. It is intensely evident at the point of origin or close to its creator, then diffusing out into infinity. Such a place as metaphysical entity may not have territorial markings of own, but sometimes are 'incumbent with the metaphorical markings' of values, beliefs, feelings, intuition, etc.

3   In formal and allegorical or abstracted form a place is a representation. It arises from the few essential elements that allow us to perceive 'a substantial space entity'. Such a representational space entity could be part of our experiences or are intuitive part of the psyche. A metaphoric place is effective till it is consciously accepted as a representative form for its economics (efficiency), and also so far as it is beneficial in spite of its myth remaining unresolved. A metaphoric entity prevails amongst certain class of people, who tacitly agree or have been socially or politically conditioned to accept such symbols to represent certain expressions, actions, etc. Such places are space impressions that are representative, immaterial, allegorical, pseudo, make-believe, or of 'virtual reality'.

A Locus is also:
- marking   -a 'place' in the universe
- spread   -a 'territory' for occupation
- space   -an entity for 'enactment' of inhabitation

- Markings that define a place in the universe are:

  Physical: such as the sphere of sensorial perceptivity and reach, communicable distance, consistency of the spatial characteristics

(similarity of space and environmental conditions creating a unique space segment) etc.

Metaphysical: such as awe, prestige, discipline, belief, fear, etc.

○   Spread is a territory that is fit for occupation. It could actualize as an act of intuition or as a learned activity. Often one cannot explain why, and how it actualised.

○   Space that is for enactment of inhabitation with three essential qualities:

Location value of a space place reflects the strength of its connections. The connections are due to both proximity and convergence of other spatial elements.

Physical features are environment conditioning factors, dimensional accommodations, amenities and facilities. It also includes associations that personalise the space.

Potential for improvisation are preeminent in the space marked for occupation. Possession is personal branding with 'something' that is very intimate and exclusive.

How an individual establishes a role locus is one of the most important aspect of sociological responses. Possession and occupation of a space immediately translates as to the degree of social reactivity. It regulates the nature of interaction with others, privacy, degree of accessibility or isolation, as reflected in aloofness, loneliness, alienation, participation, leadership, devotion, cohabitation, etc.

4   DOMAINS

A domain is an ambit over which there is some form of control. The domain could be a physical territory or an abstract effectuality. The control could be through possession, occupation, ownership, or authority. In case of territory the controlled or dominated place is used as a space to proliferate and survive. The abstract effectuality is an idea of a space, exploited to sustain and proliferates the myth of a place. All domains with a physical territory or not, do have markings that highlight their size, character, identity, distinctiveness, exclusivity, knowledge, effectivity, and conformity.

> A domain is a sphere, area, orbit, field, arena, demesne, land region, or realm. A domain is zone for activity, identity, distinctiveness, exclusivity, knowledge, rulership, effectivity, communication, belonging, control, ownership, rights, conformity. A domain is a particular environment or walk of life. It is a territory over which rule or control is exercised by a ruler or government. However, the strength or effectivity of the ruler or governor is rarely consistent, and the position shifting. So a domain is a very ambivalent term.

> Domains have a focus, centric or acentric. A domain is circular or spheroid, as its mass is spread in some balancing form around a focus. A domain is focussed inward as much as fringed outward. A domain as encountered from outside or inside but at a very close distance may not reveal its centrality or sphericality.

TERRITORIAL DOMAINS

A territorial domain is occupied (presence), marked (defined) and possessed (ownership). Historically landed territories have been occupied naturally, forcefully or notionally. To declare the occupation presence is marked by personalization. Marking of a territorial domain is considered an instinctive process (many animals do that). In case of territorial domains the physical presence in some manner endows a 'sense of ownership'. It also gets various levels of social acceptance or legality. Such ownership is always suspect, and futile in a long term. For a question like who owned it first, cut-shorts ail subsequent answers. A more powerful authority can challenge it, and forced evacuation results.

ABSTRACT EFFECTUALITY

The domain as abstract effectuality is circumstantial. It is formed by a particular environment, belief or conduct. These constituent circumstance changes with time and their effectiveness varies. Such domains may not have territorial base, and in absence of a physical occupation (presence) there is no distinctive ownership. Though if it is strongly related to a belief attributable to a person, some sense of belonging occurs. There is perhaps an authority through acceptance or confirmation but not through any distinctive ownership. Such domains are abstract spread, so its definition (marking) is ethereal or approximate. These are metaphysical entities.

Domains Territorial or as Abstract effectuality comes into being through the coinciding effects of many factors, such as:

- Nature of territorial markings -spatial quality, scale, shape, materials, connections or networking, the environmental controls, etc.
- Ambit -spread, area, volume, mass, direction, orientation
- Individual -psyche, physiology, remembrances, genetic make-up
- Owner and manner of ownership -individual or group, governance, management
- Cultural pose -beliefs, experiences, inspirations, inhibitions, traditions, etc.

A domain thus cannot be exclusively prescribed:
  - by its physical characteristics such as terrain, boundaries, environment
  - through the person, group or mode of governance or control
  - for pragmatic personal flavours it represents

IMPORTANT CHARACTERISTICS OF DOMAINS:

- Domains have two obvious features: 1 people who create and command and, 2 defining barriers or edges.

- There are Three types of Domains

  - Physical Domains: Large number of domains are terrain based and so physically well defined. Here the domain is commandeered or governed by the individual who is usually a real being,

  - Metaphysical Domains: Here an individual or group support or promote a 'non terrain' domain. In absence of any physical mark, it remains an abstract or metaphysical entity. The form of command or governance depends on the individual or the group, but it is not limited to any specific zone.

  - Metaphoric domains: This could be a physical entity (terrain based), but since its constituent force is a notional representation or ethos. The domain spread is immeasurable.

- Territorial Domains are marked by defined edges or a notion or representation as the constituting force. Non territorial domains or metaphysical domains have congregation of believers or their communication linkage that provides a sense or realm -or an abstract bound to belong to.

- Domain command or governance is observed from how well it flourishes and proliferates.

  - Physical domains not only have well-defined edges but constitute a supportive environment. An individual marks the ownership of a domain by its occupation and by placing sign or mark. An owner creates barriers to constitute a specific environment -an inhabitable space. The space is further enriched by including facilities for environmental control and amenities for conducting the tasks.

  - Metaphysical domains may or may not have an owner but there is a tacit understanding amongst the believers as to what acts are for or against the survival of the domain.

○ Metaphorical domains have a founding representation or notion. All acts and beliefs, confirming or extending the existence, are acts of participation in commanding the domain.

PHYSICAL DOMAINS

Physical domains are terrain based. Its space form presents certain environment and allows inhabitation. The manageable space is within the limits of human cognition, inside the ambit of nominal physiological capacities, and the extendible reach capacities (through devices). Such domains become very strongly defined behavioural setting, if are supported by metaphysical elements (beliefs such as privacy, isolation, reverence, fear, autocracy, etc.), and if these are reinforced by metaphoric elements (gestures, symbols, analogies, etc.).

METAPHYSICAL DOMAINS

A metaphysical domain comes into being as a spread of influence or spirit confirmed by one or many persons. The influences can also be a legacy. The domain persists, depending on the number of believers or followers, and their dedication for the cause. Metaphysical domains show a receding zone of effectuality as the staunch believer or perpetrator of the cult occupy the centre. A vigorously active metaphysical domain projects an entity that is reliable, secure, predictable, proven, acceptable to many. A metaphysical domain does not require a terrain location for identity. However participants at some stage move to a terrain-based identity, as it provides stability. In this sense the physical and the metaphysical domains converge.

For a metaphysical domain, areas distanced in time and space from the locale of origination can be re-strengthened, by controlling the dynamism (variability) of the environment in peripheral zones, by suitable space characteristics such as size, shape scale, the quality of barriers, illumination, sound reverberation, axis, orientation, etc. For stage performance actors use large garments,

extensive gestures and loud delivery of dialogues, so that last person becomes part of the show. The weak or receding areas of a metaphysical domain can also be strengthened by use of metaphors. The weak areas are intentionally populated by 'hard-core' believers, so that their confirmative behaviour is emulated by lesser believers. Political meets have back seat 'boys' (rabble) whose over enthusiastic behaviour arouses the mood.

> Free Mason Society, Vegies (Vegetarians), Cults (Hare Rama Hare Krishna) Religions, are groups operating as a metaphysical domain initially without any territorial identity.

METAPHORIC DOMAIN

The marks that form a domain become so obvious that their slight indication or their sparing presence initiate a set of effects. Such an indicative or symbolic presence creates a metaphoric entity. It is economical and efficient, as it occupies very little physical estate. Metaphoric domains are relevant to only a particular class of occupants. Others are unaware of it, or intentionally ignore it. The symbolic representations often replace the reality so completely that one often forgets what the reality is, was, or could be. This happens when metaphors are tired under several layers of conversions.

> Graphics, symbols, signage, languages, codes, gestures (body language), forms, proportions, colours, expressions, etc. are some of the allegorical presences. Art movements, fashion styles, literary movements create metaphoric domains. Some *spatial features and environmental conditions* often *occur in concert*, and so presence of one, metaphorically triggers the other. Historical monuments, places of reverence (temples, ashrams), and memorials have such eminence. Nightclubs, amusement parks, exhibitions, public buildings like airports, also have abstracted elements.

CONVERGENT AND PROXIMATE DOMAINS

Domains invariably occur in consonance with other domains forming a network of interconnections. Domains derive their functional efficiency through coexistence and dependence in contagious, overlapping or merged forms. Domains also occur as an antithesis, a contrasting element, as a real or

notional (virtual reality) entity. Heaven contrasts with the real world, and also has an antithesis as hell.

VIRTUAL DOMAINS

Such domains come into being through a wider affirmation for a concept. The governance is through the adherence and advantage out of it. Internet communities like Orkut, Face Book, Tweeter or Blogs are examples of such realms. Such domains are not tied to any geographical state. ISO Quality Management System per 900x specifications is such a domain. The only quality-mark that has been attached to it is some such standards are called Generic where as others are called Specific. In the former case it has greater application and relevance compared to the other variety, but both are Virtual domains. Such domains have multi-level terrain connections, but that is never static. The terrain connection is dynamic and so seem virtual.

DOMAINS AS SOCIAL TERRITORIES

Territorial identity of a domain at a social plane represents areas for specific behaviour. Hargie & Dickson (Skilled Interpersonal Communication) identify 4 such social territories. (See chapter 11 Privacy and Intimacy). Others have identified such spaces as tasks' settings. Social interactions flourish consistently in certain types of spaces. These spaces qualitatively contrast with 'non-social spaces' but also are distanced from the very rigid domains. Social interactions flourish in a space depending on the number of participants and their reach to each other through means of communication and recognition.

5 DOMAINS AND SPACES

Domains have Three basic constituents Formatted Space, Environment and Individual/s. A domain, as a space, is a segmented entity. Its primary segments are Core and Peripheral zones. A core is usually single, but peripheral zones are many. The core and peripheral zones often converge. Different peripheral zones impinge over each other.

SPACE FORMATION IN DOMAINS : ZONING

The formatted space endows an exclusive character to the domain. The environmental changes and occupants' participation further change the character of space. The character also shifts as amenities, facilities, enrichments in the space are changed. The focus is also affected by happenings beyond the space denoting boundaries.

CORE ZONE

Core Zone represents the commandeering mechanism and has a natural tendency to be singular and focal. The core zone has consistent environmental and spatial qualities, but its position within the domain may be shifting. The shift is due to environmental conditions, functional needs, available facilities, amenities and enrichments.

Core zones gain strength by the shape (form) of space. Space forms like concentric, conical, angular, circular etc. are focussed and so enhance the nature of a core zone. However, very extensive domains lack an effective focus. A dominant enclosure on one or few sides of a domain creates an inviolable shield, an identity of belonging, or a sense of orientation.

A core zone can be formed by the dimensional and cognition reach extent of the occupant. Such core zones are very personal, so sustain themselves

independently. The reach extent also scales the domain space. A core zone may not exist clearly where strong peripheral areas are formed by very vivid surroundings.

Core zone amenities shift due to spatial needs and environmental change. This leads to demountable or relocatable amenities such as handy or mobile tools, multipurpose equipments, plug in tools, wireless gadgets, miniaturized appliances and modular and system's engineering approach in design. Compared to these amenities in a peripheral zone are strongly dependent on the architectural and structural systems, and so are static.

> Historically a core zone of the 'Home' was the 'hearth' (literally meaning a *focus*). It was considered safe, intimate and interactive for the family. The hearth was created often without any abutting elements like a cave wall or a rock face. The ambit of the core zone was determined by the climate, the scale of the space, number of participants and level of interaction, and the degree of personalization required. There was only one such zone in the dwelling.

> The home in charge -the mother was master of the core zone. Her role and presence had become so obvious that 'the hearth, the mother and home' were synonymous. In tribal and aboriginal homes the core area is a female domain. The core zone was the natural centre of metaphysical spread 'the home', as much as the mother was de facto guardian of culture.

> Today, however the hearth is not an inevitable element for safety, security or comfort. It is the quality of barriers and other gadgets that provide this. Dwellings now have many sub domains each belonging to an individual, smaller group, or configured for a set of tasks. Very few activities of the family occur at the one place and are scheduled in the same time slot. But the family members do share a lifestyle developed through metaphysical markings like beliefs (customs, taboos, etc.) and the metaphoric means.

MULTIPLE CORE ZONES

Multiple core zones occur in very extensive domains. Such domains have weak central command and so allow formation of groups. The groups separate out primarily due to needs like *physical accommodation, need for social intimacy and reach of communication*. The groups may not seek a distinct territory or qualitative space segment. However, frequent such occurrences, show the existence of multiple qualitative space segments.

Multiple core zones also emerge where several overlapping or closely spaced domains operate within a larger domain space entity. Such core zones share the same spatial segment simultaneously or are programmed in same time schedule. Here the consistent elements are: spatial characteristics, environmental features, participants, amenities, facilities, tasks and activities. Multiple core zones tend to remain together, but often get separated by strong peripheral areas.

> Arab tents have dual core areas within the basic form of the tent, one occupied by the women and used for main cooking, and the other half is used by men and for preparing coffee, etc. These two sections are divided by a mass of stored elements, such as mattresses, floor spreads, etc. The side flaps of the tent are stretched out to create peripheral zones of various sizes. The stretched width and the angle of the flap are conditioned by the sun's position, wind direction, nature of tasks to be conducted and the need for privacy.

> Cooking and dining once (and still do in many societies) belonged to a single core zone, but were separated as two concurrent core areas. These two core areas were further separated by a pantry area that was a peripheral zone to both. Entrance is buffered by a lobby, foyer, entrance hall, or vestibule from other sections of the house. Yards, verandahs, porches are used to separate out the building from the street.

Small or one room houses have multiple core zones. These zones exist in terms of activity space spreads, which often overlap in time. The multiple core zones match the space layout characteristics, such as four corners, the area near the door or window, the area abutting the wall, the axis formed between two opposite side opening. Traditional Sarai rooms are two and half man width (2.0+1.0 mid passage+2.0 = 5 Mts or 16.5 Ft). This allows two families or their men or women to occupy a side. The depth of the room is of less important.

CENTRIC AND NON-CENTRIC CORE ZONES

Domains with emphatic barriers create a centric space entity. But domains with breach-able barriers or loosely defined peripheral identities have overwhelming outside effects that create a non-centric space.

Domains with a substantial core zone tend to be spheric. Such domains with a centric core zone are invariably static, compact and finite. Domains with an

opaque boundary are also similar. However, domains with weak boundaries have vibrant peripheral areas. A shift of the core zone towards a benevolent peripheral area becomes inevitable. A very extensive domain also provides greater opportunity for such a shift. Non-centric domains have some directionality as these are strongly affected on one edge, or are attached to other domains. Non-centric domains require far more definitive space formatting then centric domains.

> Historically kingdoms have had effective spread of their domain depending on how far and fast they could travel. Mughal kings with their luxurious retinue could not visit the peripheral areas frequently resulting in weaker control. Compared to this Changiz Khan's Kingdom extended far & wide, but not for very long. Lecture halls or areas where concentration is required have opaque boundaries and conical shape. A colony against a fort wall or along a river coast is a linear domain, subsisting on the strong peripheral advantage and so apparently may not have core presence.

PERIPHERAL ZONES

Peripheral zones are vulnerable to outside influences due to their closeness with the edge and also their distance from the core section. A core zone is dominated by the domain's main and common activity, whereas the peripheral zones are distinctive escape areas and so have diverse utility. Peripheral zones derive their functionality from nature of barriers. Peripheral zones emerge as an antithesis or concurrent space segment of the core zone. The peripheral zones are affected differently by the directional and temporal aspects of the environment. A peripheral zone is often relevant only for a while, to an individual, or for an activity.

> Once the extent of the peripheral zone was determined by the *concern for safety, warmth from the fire, the need for privacy, scale of the task-activity and distancing from elements (to reduce their intensity and reach)*. The barriers, where available formed the edge sections of the peripheral zone. These were also used for reclining, resting, hanging personal items and for expression (artwork).

Peripheral zones are primarily shaped by the core zone, but are more often affected by the nature of the periphery of neighbouring domains and

happenings beyond. The edge areas allow a person to selectively taste the happenings of outside-world even while remaining inside. Peripheral zones are flexible, i.e. can be stretched or contracted from their nominal spread. Domain transgression occurs through the periphery. Peripheral zones are dual faced, so one can orient an activity towards or away from the core area. For any other positioning one may require strong metaphysical reason.

> Peripheral zones often develop as an *acutely specific zone.* Study nooks in bedrooms, coffee rooms with the dining area, hobby zones in kitchens, home offices with vestibules, retiring rooms in private offices, vaults in banks, store rooms with homes and offices, wardrobes, shower stalls, change rooms in boutiques, cashiers' cabins, pilot or driver's cabins, reception counter, janitor area, services ducts, podiums in lecture halls, green rooms with a performance stage, ticket booths, telephone kiosks, are all examples of peripheral zones separated from the core zones.

Peripheral areas mark the end of one space entity and beginning of another one. Peripheral zones are thresholds to other space entities, and occur or are perceived to be an intermediate or buffer state. Thresholds are interactive areas, and alter (qualitatively) the elements transiting through it. Their activeness arises from their level of transparency and thickness (mass of the barrier) both of which control (rate, direction) the exchange. Thresholds also occur as an interstice on the overlapping barriers. Here two effects are simultaneously operative.

The space barriers, such as walls, roofs, awnings, curtains, partitions, ceilings, etc. form a focussed space. Yet these barriers also create segments that are more strongly attached to the periphery. The barriers, however, are always prone to change from outside effects. There are two distinct places for group mechanisms -the focal and the peripheral sections.

> Lecture halls, bed rooms, modern kitchens are single activity and so focussed units, but road side cafes are peripheral. An older style kitchen sourcing its services off a wall was more peripheral, whereas modern kitchens have island workstations, is more of core centric arrangement . A drawing room like the dining area is focussed for an activity, but a family room is multi functional and so less focal. Fire was the focus of the primitive home, and TV has become the current focus of home gathering. A physical feed-based work station is peripheral, but a wireless notepad computer offers flexibility of being anywhere.

METAPHYSICAL SPACES

Metaphysical domains have a non physical spread. Domains of metaphysical nature cannot be perceived through the sensorial system. The nature of metaphysical is intellectually and intuitively confirmed by the believers, but for others it remains obscure. To get a confirmation of their presence, metaphoric domains are implied through a physical domain. Such confirmation requires a unitary image, so strongly a centric core zone emerges often with very definitive peripheral zone. Though, to reflect the eagerness for increased participation and democratic nature the peripheral zones are made transparent, but without losing their definitive nature (presence).

> The markings of domains are characterized by the ambit of sensual perceptivity, communicable distancing, consistency of the spatial characteristics (coherent space and environmental conditions creating a unique space segment) and acceptability or confirmation by a section of the society.

Revered spaces, shrines, historical sites, haunted buildings, buildings without utilitarian functions or commercial purposes have a strong metaphysical genesis. Beliefs are *metaphysical elements* but help to create entities as effective as the real spatial ones. Beliefs borne out of instincts, concepts, experiences, etc. are rooted to the core area (the non threshold zone). In threshold areas these have thinner effect, so are impacted with beliefs flourishing in the neighbourhood. Inhabitants' beliefs also form as a reaction (antithetic) to the neighbours' conditions, and in such cases may not have any internal roots.

Metaphysical entities like home, family, group etc. come into being in a space where communication, exchanges and the intimacy occur more efficiently then elsewhere. Such space units are also 'home' to many other beliefs and notions. These are associated with a person or group, and so have a strong character. Metaphysical zones centring on a belief or remembrance of an event, person or entity are sustainable so far as believers, followers exist, conduct activities to further the belief or notion or, till a counter effect comes to be accepted. Outsiders (of other domain) perceive the essence of a domain by its metaphoric flavour, enshrined at the core zone. The core zone is identified with the symbolic presence.

Such spaces are often exclusive, irrational and have emotional flavour. The space segments are personal belonging and are adorned with metaphoric declarations. These declarations are interpretable by the individual alone, exclusive class of people, or public, and so are conditionally relevant. Such declarations overcome the shortcomings of other space qualities

Followers of a sect may revere whatever place their leader occupies as it is a metaphoric representation and strengthens the metaphysical essence. Wherever most senior family member (a grand father / mother) sits creates an aura of respect or reverence. Character of the office cabins, size and nature of chairs, dining table positions (protocol of seating in gathering) all have a metaphysical as well as metaphoric purpose.

The beliefs as a metaphysical factor cast a space that is sharper at the point of the origin, and prone to diffusion elsewhere. But often for belief to survive and gain strength peripheries are necessary. Churches, temples, Ashrams have strongly defined territory through peripheral structures like gates, walls, Gopuram, etc. The space styling, adornments, etc. physically and metaphorically help strengthen the metaphysics of the entity.

METAPHORIC SPACES

Metaphoric domains require very little estate. However to support and enhance the effect of the metaphoric presence some spatial characteristics are employed. There being a single generative concept, the peripheral zones have very small role and so a thin presence. The environ within is static reflecting nearly solid barriers. Amenities, facilities and enrichment are purposive only, and so their relocation or any shifting of other elements due to them is not required.

SPACE AND CONVERGENT OR PROXIMATE DOMAINS

A physical domain is a unique spatial entity. But often other domains are very close or converge onto it. The effect of it is seen as inward and outward

transgression of the peripheral areas. The transgressions occur to enhance the spatial character or take advantage of the neighbouring or convergent domain. Ariel windows, Bay windows, Chhatris, Balconies, Verandahs are typical outward transgressions. Whereas Chowks, cutouts, shafts, courtyards, are examples of inward transgressions. With such transgressions the peripheral areas change, but core zone remains unaffected. The core zone, more or less remains an exclusive area of the domain. Perhaps the only change that occurs with the core zone is due to the shift towards the vibrant periphery.

SPACE AND USERS or OCCUPANTS

For a user, occupation of a space triggers a set of behaviour. For occupation the user has to find the most appropriate location, orientation, body posture, facilities, amenities, and environment. One of the most natural way for such a occupation is to find a focal point in the space, or even establish a new one. These are done by positioning at some important location (cris-cross of many spatial lines), by orienting to some feature of the space (like an entrance door, window), by being closer to something (wall, column, furniture), by associating with other occupants (through 'social distancing'). Here other operative factors are: range of cognition (capacity to perceive), physical proximity (level of social interaction), scale of relationship (age, sex, social status) possibilities of communication.

The user also needs to have some control over the space, such as: Opportunity to change the location and position (including the posture) within the space; Choice to interact or not with others; adjust the spatial quality at micro level (scale and schedule wise) and thereby the environmental conditions; Be noticed or notice others; Form sub-core zones, Shift to peripheral zones and be able to conduct exclusive tasks; and Way to leave the space either in full knowledge of others or without being noticed. A user, unless is an owner of a domain, will not be allowed to change the architectonic character of the space, import, shift or relocate amenities and facilities, alter the quality of environment that perhaps is not acceptable to others.

In very large spaces adjacent walls, hedges, mid columns, flower pots, water fountains, lamp posts, flooring, ceiling, and such other patterns and objects provide points of anchorage for space occupation. Spatial configurations like a stage, podiums, projection screens, speakers, singers, vivid objects, also hold interest by providing involvement.

In parties, hosts make a conscious effort to break intimate formations by removing or adding key or active persons, or repositioning and rescheduling the activities. In clubs and places of entertainment the environment (lighting, furniture, equipment) and programmes are reset to shift the focus off certain space segments. Group gatherings are designed to occupy different space segments (hall, terrace, lounge, library, garden lawn, etc.), variegated environmental conditions (bright vs diffused illumination, change of music, etc.) and diversions (toast by the host, magic shows, musical renderings, dancing, etc.).

INTERPERSONAL RELATIONSHIPS and SPACES

Groups require space for interpersonal relationships, expression and its perception. However, the 'depth' required for such interactions in physical domains is irrelevant for virtual domains like telephony or video conferencing, chat rooms, hangouts, etc.

Interpersonal relationships have no relevance in acutely sized and defined spaces (ergonomically sized, shaped and provisioned with facilities), such as: toilets, kitchens, storerooms, study nooks, booths, etc. However, bedrooms, drawing rooms, office cabins, etc. allow interpersonal relationships, often in multiple varieties simultaneously.

Ideal place for a single lot for interpersonal relationship is the core section. This has least external disturbance, so should be an area of tranquillity affording privacy. Yet peripheral zones are more preferred as a place for intimate relationships and commitment. In restaurants, cinema halls, public parks, large waiting areas, people move to corners and edges for seclusion. Threshold areas though peripheral, are public and vibrant. Threshold areas are considered ideal for noncommittal interaction.

The group behaviour mechanisms exploit the space characteristics to infuse emotional and social functionality. Group behaviour depends on individuals as well as interactions amongst such individuals. An individual projects

psychological and sociological responses. The group behaviour though erratic has a degree of commonality - raison d'être (cause) of formation of the group. The common approach of the group is an assurance that their peculiar behaviour is not an aberration but a probable happening.

6   EXTERIOR AND INTERIOR SPACES

A space is a recognised and improvised, or a designed configuration for a range of behaviour. The layperson who recognises and improvises, or the expert who designs it, can only surmise how it will manifest. The stack holders are often not aware of the basis of its recognition, improvisation or design. Yet everyone, the designer and the user do arrive at common realization.

The spaces have two distinctions: Exterior and Interior. Exterior has two distinct zones: One where the extent is endless and beyond the perception limits, and, Two where the edges limit the perception creating 'neighbourhood spaces'.

Very vast exterior spaces are recognised for the endless sensorial 'effects'. Other exterior spaces are finite, shaped and sized by bounding elements. The bounding elements are natural, and exploited or improvised. Spaces for inhabitation require greater degree of intervention then improvisation, and so are designed.

For each of this intervention the spatial definitions are different. Very vast exterior spaces are recognized through markings. Neighbourhood spaces are known through their bounding elements. Whereas spaces for inhabitation need an enclosure, often much more elaboration then anything nature can offer or can be improvised upon it, so are designed.

SPATIAL DEFINITIONS

MARKINGS

A very vast space is perceived through its markings. A '*beautiful sunset, a valley or seashores*' are markings of a space. These are evident through the physical elements like: edges, banks, thresholds, slopes, plains or fences and environmental effects thereon. We perceive only certain range of space. The

reach varies with perceiver's capacity, needs and environmental conditions so is very circumstantial.

> *These are few quotes taken from historic text documents that describe the markings of Land-Spaces.*
>
> US President Thomas Jefferson insisted that the purchase included 'all land to the east of the Rocky Mountains and to the north of the Rio Grande'.
>
> The (Spanish) missions were located in a disputed area; France claimed the Sabine River to be the western boundary of Louisiana, while Spain claimed the Red River was the eastern boundary of Texas, leaving an overlap of 45 miles (72 km).
>
> "From the point on the north bank of Muddy Creek one mile above the junction of Muddy and Indian Creeks, north for 400 yards, then northwest to the large standing rock, west to the large oak tree, south to Muddy Creek, then down the centre of the creek to the starting point."
>
> "Lying in Anson County, on the side of the Atkin River, beginning about a mile below the fork of the fourth creek that empties into the said river, above the waggon ford, running up the said creek for complement, including an Indian Camp about eight miles beyond the path that crosses the buffalo licks."

BOUNDING

Spaces are also bounded by elements that curtail their continuous perception or environmental effects. Bounding elements are more apparent in exterior 'neighbourhood' spaces. These are spatial definitions that dimension, gradation, scale and proportion. The bounding elements indicate the purpose of the space and in many cases even the nature of its ownership and structure of administration. The bounding elements endow an exclusivity through a change such as a drop in terrain, contours, variation colour or texture, illuminated or shaded objects, etc.

ENCLOSURES

Enclosing elements are also bounding entities. These are very evident from the change in environment they cause. Enclosures are either natural or man-made. The enclosures as a spatial definition create a dimensional space. The

enclosures are provided by the shell, roofs, coverings, awnings, curtains, partitions, ceilings, etc. Enclosures create an interior space. A space created by the enclosure is far more enduring then one defined by bounding.

BEHAVIOUR in SPACES

Wild exterior spaces: The behaviour in space is formed by the spatial definitions like the markings, bounding and enclosures. Markings denote the natural extent of the wild exterior space. But the same markings may not be perceptible. The behaviour with reference to markings is perfunctory as it relates to the potential -*what can one do with it* ?

Neighbourhood spaces: Markings help create anchor points, line links and extent spreads. This elemental bounding become the setting for prime human endeavour (and so the behaviour) to occupy and possess a space segment. These space segments, separate the wild exterior from the interior space. The space becomes a place for everything that an interior space cannot offer. It becomes a place for informal social contacts. This is the next grade of exterior space, the neighbourhood space. A neighbourhood space comes into being and remains valid in the context of interior spaces.

Neighbourhood as an exterior space is finite and predictable. It is both a 'collection of individuals and a place, the people who live there and the place itself'. Here the social ties develop not just due to people involved but due to the setting of the place. Neighbourhood spaces have recognisable geometric order or a predictable configuration, purposive locations for anchorage, well-defined zones, distinct routes and paths, good visibility (and other clarity of other sensorial perception) and recognition of the whole and its parts.

The depth or scale as defined by the bounding elements mainly depends on the reach capacities. In other words the bounding elements are within the sensorial reach such as vision, hearing, smelling,

touching, etc. These elements individually represent varied reaches, so space definitions here match to the purpose.

- 'a jungle of apartments where no one knew who was dead or who was celebrating what - but an archipelago of neighbourhoods in which everyone knew each other.' - Orhan Pamuk, Istanbul: Memories and the City.

Interior spaces: The interior spaces are enclosed entities. The outward sensorial reach beyond the edge of the interior space does not affect either the wild or neighbourhood exterior spaces. However, other way around, Interior spaces are affected by all the happenings in exteriors.

A 'wild exterior space' due to its uncertain character and infinite size, cannot be possessed. A neighbourhood space lacks the settings and environment for any task other then the casual social interaction. An interior space is controlled and a domesticated entity, and so allows a set of activities.

The enclosures of the interior spaces have varied levels of transparencies. The openings in the shell allow escapes at many places. The transgressions across the enclosure occur as outward push and inward pull of the interior space. The outward push or encroachments are often 'costless', though may 'load' the enclosure (shell) body. It increases the interior volume and permits a restrained exterior. The inward intrusions, however, consume interior space or estate and reduce the nett enclosed space.

All transgressions add extra surface over the enclosure body, with or without a proportional increase in volume. Both types of transgressions, inward and outward reach, make the interior spaces vibrant.

Examples of outward transgressions: Galleries, balconies, Chhatris, campanile, bay-windows, oriel-windows, dormers, Mashrabiya, verandahs, skylights, etc.

Examples of inward transgressions: Cutout, Chowks, courtyards, Liwan, setbacks, cutbacks, shafts, light-wells, etc.

THRESHOLD AREAS

Thresholds are real or hypothetical divider marks between two very distinctive spaces and so if the distinction is dull there is no or a weak threshold. Thresholds occur at cuts and cleavages of enclosing elements of Interior space. Enclosing elements have various degrees of translucency and discontinuities where the exterior and interior have immediacy. A threshold is a place to realize both the exterior and interior concurrently, and so the thresholds are very interactive areas. The divide, presented by the threshold is not a clean edge-cut, but has a graded formation.

The thresholds are formed within the physical barriers. These barriers define the shape, size and environment of the interior space through their constitution, thickness, mass, volume, size, absorbency, transparency, etc. Other factors include the size, shape, location and orientation of the thresholds. Thresholds also have abutting structures to create intermediate climatic zone and also interpersonal space.

> Tropical temples have low or no window sills compared to the tall sills of North European churches. Indian temples have high plinth and fairly tall door threshold whereas N European cathedrals have comparatively average plinth and no threshold in a door like openings.
>
> A threshold may be an abstract divider in space like the Laxman Rekha but a change marker. Thresholds are marked by change in quality of flooring, illumination, sidewall configurations and by elements like high sill, steps, opening portals and pediments. Architectural attachments like verandahs, canopies, overhangs, otalas enhance the threshold's functions. In thick-wall structures, openings get a substantial depth creating an interpersonal space as in gates and gateways, or in windows a shading device on external sides or an illumination diffuser on inside.
>
> In Kutchh Bhunga houses doors are predominantly South (windward) face and women folk occupy the threshold for craft and household work.
>
> A change in floor or ceiling though a physical marking, can metaphorically declare a change in the purpose of a space. A floral design vs a geometric pattern in flooring or trellis conveys a different attitude. Vernacular interior spaces, heritage buildings and 'master piece' architectural creations (created by acknowledged masters) abound with metaphors.

Structures abutting the threshold are like exterior transgressions and so form an intermediate climate zone and interpersonal space. Neighbours and visitors

have their first encounter here, so become an ideal space for metaphoric declarations such as signs and symbols. These areas are declaration of personalized space. Metaphors occupy very little or no estate, and are interpretable by only a class of people. Both of these properties are exploited in creating acutely functional and very exclusive interior spaces. 'The metaphors provide exclusivity to the space and economics of expression'.

EXTERIOR vs INTERIOR SPACES

EXTERIOR SPACES

A wild exterior space defined by the markings is an infinite realm. It cannot be a setting for personal or interpersonal behaviour. One can perhaps realise a potential to possess it. The act of possession requires definitions like bounding to define a space entity. The bounding are elements recognised as they exist as anchors or starting points. Where such points do not exist, new ones are created.

> Planting trees in a row, digging a trench, clearing a land, fencing, planting posts at corners, scrapping tree barks, placing distinctive patterns or configurations with stone, leaving extinguished fire with a visible heap of ash, leaving excreta, are some of the elements and methods to indicate possession or occupation.

However, an exterior space with potential for possession does not become a setting for habitation till it is further sub-zoned into locations for various tasks. The sub-zones are attached to the bounding elements and so closely identified with the environment available there. Neighbourhood exterior spaces have such sub-zones.

> Primitive-men started their settlement with not just space for the families, and safe place for fire, storage of tools, food, water, place for craft, etc., but also a place for skinning and cleaning the kill. The later was dirtiest task and generated foul leftovers. These set the activities that were interior vs exterior.

Neighbourhood spaces have paths and open spaces that both connect as well as separate various habitable spaces. Here it is not the distance but the degree of dependence that forms unified neighbourhood space. The dependence is need based as much as it is perception based. One may not know or formally

meet the neighbour for years, or ever, but the perception someone is staying in vicinity is a great social comfort. Very often even the presence of a man-made object provides the same comfort.

INTERIOR SPACES

An interior entity is recognised by its enclosure. A very strong enclosure creates an isolated space, with very limited relevance. However, translucency of the enclosure brings in environmental variations to the interior. The interior space and the timed environmental variations create a wide variety of purposive settings.

Interior space has lots of variegated sub-entities within. The prime variation causing element is the orientation specific and partly predictable environment. The degree of translucency of the enclosing elements adds several alternatives to this. Other variations are related to the use and are specific to perception and adoption.

The form and format of an interior space are unitary and consistent, but the subsections show minor, local and temporary variations. Peripheral zones become a multilateral entity reflecting the environmental variations. Where such variations become extensive and a permanent a new spatial entity comes into being. For example, cooking-dining, kitchen-bathing, entrance-living room, etc. have been adjunct as well as segregated entities, at different times and within same era for different social reasons.

An interior space however isolated and insulated cannot exist without the environment. But it is not always necessary for the internal space and external segment to be concurrent in time and space. One can conceive the Interior or Exterior alone, without the other being present in time and space proximity. The virtual immediacy of the two realms is achieved by carrying across the impressions of the other. The duality of the interior and the exterior is like an antithetic zone to the other.

One can also replace the physical presence (manifesting in time or space) of the Exterior or Interior realms through their notional representations. The Internal and External spaces, can occur as a 'metaphoric concept' for the other.

> The heaven and the hell are two surrounds of the earth. Egyptians have dummy doors (drawn or carved) in their tombs. A Garbha Griha in a temple is an inner sanctum. The Japanese gate *Mori* is placed anywhere, in a vast open land or sea, to mark a divide. *Lakshman Rekha* was a notional boundary.

Presentation of metaphoric or symbolic elements suffices to initiate a full scale happening. Pictures or names of gods on doors protect the house. Mime shows, and Bharat Natyam dance mudra enacts space through metaphors. Metaphorical declarations mark a qualitative change, and are used to compensate the territorial presence of physical and metaphysical elements.

Interior spaces have varied zones. An insulated and less affected segment, of an interior space is its core segment. A core segment is nominally centric. At the core segment metaphysical elements like concepts, beliefs, taboos, etc. that reflect the essence of the inhabitation are stronger. Whereas metaphorical elements like signs, symbols flourish towards the peripheral segment.

Interior spaces are recognised for their potential for functionality (size, shape), environmental control and sensorial adequacy. Sometimes these spaces are designed to alienate the users from the expected set of things. Such diversions are used to excite, to register the change (mark of new and end of old) and also to destabilize the users.

THE MAKE-BELIEVE IN INTERIOR SPACES

Interior space seeks to be a spatial organization for specific environmental conditions and class of users. However, for circumstantial reasons, it is not always feasible to achieve a perfect set, in a particular space, with available technologies and in required time. To overcome such deficiencies, Interior spaces are often endowed with make-believe inputs or effects. The 'make-believe' is an economical (time, extent, money and effort) substitute for the

original. The 'make-believe' also offers an exciting tool for creation of new experiences.

Make-believe also provides for surprises using conventional elements and settings. The make-believe is created by substituting elements that have strong association with specific effects, such as: materials, technologies, spatial scaling (size, proportion), or temporal skewing (enhancing or delaying the event).

> Our nominal experience tells us that dark spaces are cooler and quiet or conversely bright spaces are noisier and warm, but these expectations are purposely replaced in maze or adventure tunnels in children parks. Night clubs are darker but noisier and prayer areas are brighter and yet quieter. A transparent material is not structural (non-load-bearing) and is fragile (glass acrylic), both are belied in buildings, as dance floors. Laksha-Grih of epic Mahabharat was based on make-believe effects of materials and our sensorial conditioning. Glass and mirror have been two major materials for make-believe.

REACH IN SPACE

The reach capacities are physiological such as the limb capacities, and also the sensorial capacities. One can upgrade the limb capacities by training or practice. Beyond the nominal limb capacities we employ extension tools (handles, tongs, hammers, chisels, etc.) to expand and modify the reach.

> People have very widely variable capacity to move the limbs, depending on the experience, habit, body size, age, sex, situational demands, direction of movement, opposite thrust, friction, mass, springiness and accruing advantage or pain, etc.

The sensorial capacities have inherently limited range, but can be magnified by tools or even transformed by changing the mode of perception. The limb capacities are too insignificant in scale for exterior space. The sensorial capacities define what we perceive in exterior space. It is through the definition of reach-limits one can define the metaphysical edges in the exterior world. The reach range becomes 'the differential between for here and beyond'.

> For example we study space by high magnification (greater focal length) telescope lenses, but beyond that we listen to the space or study the energy emissions as

spectrum of wavelengths. Ultra sound helps us to check body insides, welding and earth structure.

The five senses ordinarily enumerated for animals include sight, hearing, smell, taste, and touch. Other senses include the kinesthetic (motion) sense, the senses of heat, cold, pressure, pain, and equilibrium, or balance. A human being can listen to sounds within the range of 20Hz to 20000 Hz, beyond these range one may not hear the sound but experiences it as an energy causing chemical and other changes. The capacity to perceive sensory stimulations vary with person to person, the physiological condition, age, habit, experience, psychological state, etc.

Reach within an interior space is contained and conditioned by the enclosures. Whereas, the reach, in the form of transgressions across the enclosures and in the neighbourhood spaces, is governed by our body's sensorial capacities. The wild exterior spaces cannot be comprehended by the reach capacities.

Reach capacities in Interior spaces can be re-calibrated by using background-foreground contrasts, through sensorial qualities, isolation through distancing, by differential movements, by stagnation or consistency, by perspective view or visual concentration, directionality, scaling, proportion and other modulations.

INDIVIDUALIZATION : PERSONALIZATION

Neighbourhood spaces are individual but groups of people through continuous use and exploration have possessive attachment to it. They collectively encourage and sponsor, not only its upkeep but take steps to improvise it. The group of people, who are part of the neighbourhood spaces by virtue of being in their sensorial command, develop common culture of dealing with it. The common culture is the personalized version of that neighbourhood space. A new entrant perceives it and abides by it as a sign of good social behaviour.

Interior spaces are continuously personalized by their habitants. Interior spaces designed by others (designers or other owners-habitants) are further domesticated for personal flavour. Some have called the process as 'enriching' a built form. The process could be very slow, or delayed due to circumstantial reasons such as finance or motivation. The process of individualization is both,

opportunistic as well as intentional one. In the former case, one takes advantage of the situation as it arises. The later case strategies occur after aspirations accumulate and realizations occur. The process of individualization is not often apparent to the inhabitants as they are continuously involved in the situation. They become aware of it when on an accumulation it pauses a disastrous effect, or when in retrospect one realizes the quantum of change that has occurred.

In public housing a standard design is exploited differently by various families. The same styled modular offices, cabins or hotel rooms are individualized. Long used or familiar spaces seem very secure and comfortable. Whereas in new spaces a user seeks familiarity of form, utilities, equipments, furniture, furnishings, environment, other users, etc. These are transplanted physically, metaphysically and metaphorically. Even the best designed interior space gets changed (individualized) by the user.

Greater personalization of an interior space affords efficiency but also leads to intensive possession of the space. The intensive possession ultimately becomes so overpowering that further modifications are resisted. The ethnicity, as a desire to extend the past, is over valued. Such a habitable space becomes set with many metaphysical elements, and lots of metaphorical elements emerge in the living space. The reluctance to change is challenged by many factors such as: environment, ever-changing age and relationships' profiles of the occupants, need to repair or replace the space making elements, the desire to impress and win-over others with the sheer efficiencies of the inhabitable realm, compulsions to make a radical start after a failure or shock (death, sickness, an accident, a calamity, a breakup in relationships), etc. Technological developments present better ways of doing things, so are a great force for change. Environmental changes relating to climate, terrain and developments in the neighbourhood force unavoidable change. New friends, relationships, neighbours, etc. provide impetus for change. Developments in means of communications (telephony, intranet, travelling, etc.) have affected how people conduct their life.

Three distinct levels for Space Personalization:

1   Inhabitants change the space-environment settings by physical interventions.

     The physical attributes of the space, namely: size, scale, shape and form are exploited to achieve a perfect mix of space-environment as a setting for behaviour. Habitants aspire to change the environment through definition of space making entities, such as the edges, barriers, partitions, etc. These entities on their own cannot substantially change the quality of environment, but do enhance, delay or redirect the effects of environment. The entities exploit the locational, directional and cyclical qualities of environmental aspects. Occasionally Facilities and Amenities (see later chapter) are used to condition the environment.

2   Habitants change their lifestyle to adopt the circumstances. One learns from encounters with spaces and environment directly or through others. This is a slow and continuing process. It flourishes as an ethnic style. In the past such lifestyles endured till other efficiencies and novelties emerged, but nowadays media does not allow the 'local' lifestyles.

3   The manifestation of behaviour becomes an expression. Such expressions have cultural roots and so meaningful justification. However, behavioural expressions get transmitted beyond their spatial realm of origin and do not carry the same meaning. Such transmitted impressions change the local norms of behaviour.

> Salute, Salaam, Namaste, Adaab, High-five, bow and Aashirwad are expressions of greetings, obeisance, acknowledgement, blessing, acceptance, etc. Many of these have been transmitted beyond their original realms and now carry a different meaning.

Migration has been a very active agent for recasting of interior spaces. Migration for economic, political or tragical reasons forces one to adopt new terrain, environment and neighbourhood. Some migrants keep an unbiblical

connection to the place of origin, and others may not have any kinship. Migrants with no ethnic roots adopt to new conditions easily, but may not have the skills to tackle a new situation or crisis. Whereas one with some affinity will have ways and means (necessary skills and legacy to handle the unusual conditions) to transpose the old values and styles.

ENVIRONMENT FORMED WITHIN INTERIOR SPACES

One of the most important formative processes for interior space is the environment. That is why, the space and environment though two distinct entities, condition the human behaviour as a single happening. Since environment is ever evolving and so varies the space continually. As the space changes with time, so does the behaviour of the occupants. In other words', the behaviour changes with space and time. A space with irrelevant environment is abandoned, improvised, or adopted by inhabitants with change in a lifestyle.

> Some aspects of environment change with predictable periodicity (light, seasons, etc.) whereas other factors are unpredictable (wind, rain, etc.) The occupant or the user has different levels or receptivity. The same space could be depressing or inspirational at different times, because the environmental conditions are changed, and because the bio system of the inhabitant gets set to a different mode. The space has a subjective significance to its inhabitants.

ACCOMMODATION OF ENVIRONMENTAL CHANGES

The inhabitants develop a dynamic approach to sustain the occupation of a space. Essentially minor changes are accommodated at personal and passive level, i.e. by recasting of the lifestyle, body posturing, metabolic activity, rescheduling, etc. At micro level the changes are absorbed by activities like repositioning of the furniture and facilities, establishing improved amenities, etc. At macro level the changes are assimilated in terms of additions, alterations, renovations, etc. in the built form. At a radical level the changes may force recasting of the group-dynamics (treaties, friendship, divorce, etc.), or migration to new locations.

The environment is conditioned at many different levels:

1   Environment conditioning primarily occurs at a personal level, when a human body adapts itself to the environment.

2   Clothing provides the cover.

3   By rescheduling and relocating tasks, substantial degree of environmental adjustment can be done.

4   Barriers are formatted to meet the challenges of the environment.

5   Moulding of a space configuration to reform the environment, by inward and outward transgressions.

6   By modifying or exploiting surrounding elements (buildings, slopes, hills, trees, caves, valleys, gorges, etc.) the environment can be controlled.

7   Specific amenities and facilities to regulate and exploit the environment.

8   At another level beliefs, feelings and experiences help overcome the apprehensions and master the environment.

In an Interior space, the environment in spite of being contained and controlled, remains an ever-changing enigma, and so do the responses of our body.

7   SPACES SIZES AND SHAPES

Size and Shape of a space are perceived in terms of their utility (functional adequacy), ergonomics requirements, past experiences and sensorial reach capacities. The size and shape together also define the nature of Core and Peripheral zones of a Space.

The size and shape of a space have no relationship on any scale. In all architectural styles (Renaissance, Gothic, Byzantine, etc.) their end periods are marked by extensive transgressions out of their inner spaces. In such extensively transgressed entities, size or shape are difficult to recognise. It also denotes the saturation of the place for the innovative human behaviour.

For any space, shape and size are two major formative factors. The shape is an absolute function and can have many different configurations. The size is a large variant but is a relative function (to the human body). Within a space various forms have interrelationships of proportions, analogy, sequencing, proximity, etc.; all these are absolute functions.

> Shape configurations are closed or open ended. Some show potential of growth through distension, others are open to attachments. The shape expansion is linear, planner or volumetric, and local, pervasive, directional or haphazard. A spatial shape reflects the constituent forces, so a shape could be changeable or consistent.

> Size is fundamentally scaled to the human being, but it also represents capacities of retaining, spreading and distancing. These capacities also reflect the effort and duration required to possess, occupy, use and even dispose off (de-possess, de-occupy) an entity.

THE SIZE

At Absolute level the size is perceived as the difference between the Length and Width of a space. It is seen as a narrow or wide entity. The height confers its own scale of narrowness or broadness to the space. Height accentuates or de-emphasizes the character of the space nominally

contributed by the relation between the Length and the Width. The equality of Length and Width of space marks a balance. The orientation of smaller or larger size gives a feel of a deep and shallow space. All these terms also give a sense of direction (long vs short) in the space.

At Relative level the size of a space is scaled to the body size of the occupants. Such scaling confers certain functionality to the space. The nature of cognition, reach, communication and exchanges are function of the space size. The levels of intimacy, the loss of objectivity and subjective involvements that occur in a space, are governed by its size (related to the body of the occupants). The size is seen as the facility of accommodation and also future potential for alternation, improvisation, and personalization. Size in a neighbourhood space is perceived in terms of reach. Here the recognition of reach also defines its functional adequacy for interpersonal relationships and related behaviour. The sizes are defined by the mutual relationship between spatial elements and their perception.

> A hazy or foggy atmosphere dulls the perception of such elements as much as a bright sunny day highlights the spatial elements through enhanced light and shadow differentiation. Past midnight in absence of nearby background noises far-off sounds are acutely heard, increasing the extent of the neighbourhood space.

A space is perceived to be small, adequate or large in terms of various tasks, and in terms of responses it offers such as echoes, reverberation, reflection, illumination, glare, vision. Same space may be seen to be of a different size depending on the recent experiences. Most people find hospital wards to be very strange (large). Occupation of domains with unusual proportions (combinations of lengths, widths, and height) and sizes require extra efforts of accommodation.

Functionality and the environment are difficult to separate, as one seems to manifest the other. For a lay person, spaces within the known range (of recognition) are predictable and so manageable. The strangeness or alienation is reduced by introducing scalable elements. The scalable elements in a space include repetitions, rhythmic evolution, structured patterning, sensory gradation, acceleration-de-acceleration, graduated changeovers, linkages, relationships through modulation and proportioning, etc.

A patient, in a large ward of a public hospital, experiences the very large space to be strange compared to domestic (home) spaces, because the space size proportions are different, surfaces are harder and less absorbent (causing reverberation to be different), background noises are less passive, illumination levels are brighter during day and night, furniture and furnishings are unusual, in addition to sickness and weakened mental faculties.

SPACE SIZES and BEHAVIOUR

In a space entity a sub-core zone represents the variations. These are marked with graduated as well as substantive changes of sizes. Within a space, the size (and thereby the proportions) changes provide variegated settings for different activities. Architectonic elements form static sub-core zones. However, transient elements like environment form dynamic sub-core zones. Variability of sub-core zones is sometimes due to the processes of perception. Perception of space size and its modulation is predictable due to past experiences, but persons' age and moods do affect it. The nature of variations (static dynamic, sudden, or as a surprise) of sizes, proportions, and their occurrence (sequence) in a space cause a very marked shift in human behaviour.

Space proportions, sizes, their placement and sequencing are very important tools of space design. Designers, intentionally avoid as well as include such contrasts, but then surprises do occur. Such spatial manipulations and surprises are further exploited by the users for individualisation.

SMALL SPACES

Small spaces are small absolutely and relatively. A space is considered small if one, two, or all of its dimensions (Length, Width, Height) are small in comparison to the occupant's body size and inadequate for task requirements. A space is considered small (narrow) if one of its horizontal-spread dimensions (either Length or Width) is proportionately smaller.

Small spaces are often considered intimidating and claustrophobic because the core zone nearly embraces the entire space, leaving no or very small peripheral space zones. Such an exclusive core space zone is too susceptible to affectations from neighbouring domains. Small spaces evoke overwhelming power of the barriers, such as no echoes, or no depth for perspective perception.

Small spaces are intimate and show good recognition. Small spaces aid intra-personal communication and exchanges. But very small spaces become too personal for reasonable or objective communication Small spaces are acutely specific for one or few activities and so are manageable. Small spaces may be functionally adequate by themselves but do not permit even a temporary expansion of an activity. Small sub-space modules have a tendency to merge and form a larger system, as it saves estate wastage in peripheral zones. Small spaces have bulged (transgressed) peripheral zones.

LARGE SPACES

Large spaces have large core zones and equally large peripheral zones. Very large spaces have diffused or multiple cores. Diffused cores have poor recognition, communication and exchange capacity. In large spaces the distanced barriers are also less commanding in the quality of the core zone. A large space with fewer occupants may seem impersonal compared to small spaces that in some way infuse intimacy. Large spaces allow individualization, but group formation becomes uncertain. Large spaces confer power to the individual who can *own* it and have the reach capacity to control it.

> Amphi theatre performances require large frill dresses, loud dialogue delivery, spaced out movements -theatrics, real or make-believe sub-zoning of the stage. Large space audiences can be reached through public address system, a large podium, stage setting, colour-light highlighting, etc. People in large spaces like airports and marriage halls reach out to others through wild gestures, shouting etc.

Large spaces seem alien as the edges are less definitive. Here the peripheral zones are too segmented and varied. Occupation of large spaces is challenging. One needs to find points for anchorage, a direction for

orientation, presence of other human being (or an animal like a dog) for confirmation, and a ready strategy for exit in any exigency.

NARROW SPACES

Narrow spaces have one of the floor dimensions (width or length) proportionately smaller. Spaces with a strong linear (directional) character seems narrower. Narrow spaces are functionally single-purpose, such as stairs, passages, roads, corridors, etc. Narrow spaces discipline the movement. The functional inadequacy of narrow spaces could also be physical, a carryover of the past experiences or a psychological condition. Taller spaces often seem narrower compared to a shallow (low height) space with the same floor spread. Narrow spaces have domineering effect of the side barriers, more so if these are opaque that is without any break or transgression. Narrow spaces allow formation of small groups. Linear distance among the groups increases the privacy and intimacy. Narrow spaces may have multi-core spaces due to the specific conditions available locally such as near the doors, windows, columns, corners, benches, niches, public address systems, focussed illumination spots, air movement-delivery and ventilation nodes (fans, air conditioners, heaters), stair entrances, junctions (cross corridors, floor cutouts), signboards, parapets, ash trays, etc. Narrow spaces in their longer direction are leading and focussing, and in the shorter direction are diffusive and non-attentive. Common art galleries tend to be linear spaces as exhibits are smaller, but master piece show areas in museums are non linear for distance viewing. The hall of mirrors, Versailles is a classic example of long space; opaque on one side and fully windowed on the other side.

WIDE SPACES

A wide space is very ambiguous a term. All large sized spaces are also wide spaces, because here both dimensions are functionally more than adequate. A corridor is long (so essentially narrow) element, but could have generous width, making it a wide lobby or a hall. A space seems wider if it is less

occupied and sparingly furnished (a vacant hall). Shallow spaces (low height) seem wider and larger. Wide spaces have distanced barriers and so mid space elements like columns, central furniture pieces, floor cut outs, etc. gain importance. A space may seem wide if its barriers are non opaque, allowing vision, movement, etc. across it. Wide spaces allow group formation. Individuals and groups have intimacy and privacy due to inter group distancing. Wide spaces if adequately dimensioned permit sub-core activities near their peripheries.

TALL AND DEEP SPACES

Tall is a 'height' identity and Deep is frontal distance distinction. In both the cases the side barriers have a strong impress that often restricts or affects the apparent size perception. However, Tall and deep spaces acutely reveal their functionality. Chowks, cutouts, light wells, stair wells, under sides of domes, etc. are directional (vertically stretched) and static (non changing) spaces. These are considered ideal for non diversionary activities like study, meditation and prayer. Exhibitions, museums emulate this effect, by spot lighting the displayed items. Tall and deep spaces restrict the transmission of background noise (nearly absorb all the reflected sound, allowing only the direct waves).

FORMS OF SPACES

Forms of Spaces affect the spatial qualities and so the human behaviour. The form of a space is relevant, if only, it has peculiar ergonomic, functional and sensorial (visual-depth, audio-reverberation, touch-proximity) size character. The form and size, both emerge due to the barriers.

Our perception faculties are directional and nodal. Hearing and vision, are bi-nodal. Vision, smell and taste faculties are frontal, whereas touch is non-local. Balanced or equilateral spaces, such as a square, round, or a triangle shaped, are difficult to occupy at their nominal centres. For such balanced spaces a non-centric location that is towards a contributing periphery is better.

The nature of activities in a space help highlight or de-emphasize the shape. A spiral stair's circular movement enhances its vertical scale, but a right or left turning spiral could, respectively, mean upward or downward movement orientation. Minarets and Gopuram narrowing skyward enhance the vertical direction.

Shapes like convex, concave or parabolic curvatures modify the movement. Planes that slope away or towards the user, mean opening or closing of the form. Right and left turns have culture specific relevance which may override presumed biological preferences.

> British Parliament has opposite benches in long rectangular room, signifying one is either for the government (ruling party) or in opposition. Many other parliaments in multi party democracies have segmental circle forms, with speaker occupying the cut end. Equal participation seminars are held in square or circular rooms. One way affairs, like press conferences were once held at the smaller end of a rectangular room, but are now held with a wider end as backdrop to facilitate video shooting. Lectures, discourses are focussed to the speaker. Fashion shows use the long axis of a rectangular space to be with the spectators.

> In an Olympic main stadium is a multi game facility, where events like opening - closing ceremonies get a highly defined shape - form, but smaller items of athletics get a de-emphasized (nonspecific) shape entity.

Monuments designed for posterity (historic buildings, memorials), government buildings, institutions associated with discipline (army training, hospitals, research laboratories) overwhelmingly have cubical shapes or regular circular forms. A square or a circle subsist on their own and seem to survive in all types of conditions and times. Inversely a free - irregular shape may not last unless it is properly oriented, and made to fit well in a setting. Geometry of a form is transmittable across cultures.

Closed in overhead forms like domes, pyramids, tents, etc. seem to provide greater cover and so protection compared to regular cubical or flat roofs. Sloped roofs and floors not only indicate an orientation but enforce concentration (or dissipation). Slopes indicate a gradual change whereas stepped forms show a sequential change. Slopes have been used to merge different domains, and steps to demarcate the divisions.

ENVIRONMENT IN SPACES

An individual experiences environment and space as inseparable. A space entity offers several sub environments in its peripheral areas which in turn highlight an aspect of a space. The multilateral mix of environment and spatial characteristics, when combined with the daily, seasonal and diurnal variations of the environment provide for great variety of choices. The choices allow one to explore, improvise and individualise a habitable territory.

Environment is conditioned at specific locations. Such efforts include architectonic elements like shading devices, barriers, reflectors and receptors, insulations, time delay mechanisms, etc. These are overt attachments to the building shell facilitating a task. But very often the space-form is moulded to serve these purposes.

> Cooking and dining, were activities occurring close to the hearth, but cooking preceded the dining. These time scheduling allowed them to be separated. Similarly, dining was an occasion for family get-togethers but presence of an outsider disturbed the intimacy of the family. So cooking, dining and social gathering spaces separated from one another as sub-core zones. In single room houses such territories are metaphorically identified, flexible in size, and relocatable. In large buildings these are physically marked as rooms and have metaphysical associations.

8 BEHAVIOUR IN SPACES

FIRST SETTING FOR HUMAN BEHAVIOUR: The Neighbourhood

A space is a recognised entity by marking (wild exteriors) or bounding (neighbourhoods), and therefore the prime realm for human behaviour. In the first instance the markings though uncertain help recognise that it has a potential as a place for habitation. In the second instance, the neighbourhood space is for community and so for group behaviour. It is finite, reasonably non changing and manageable. Its spatial definition and the environment condition allow 'intra-personal' human behaviour. The space and the environment, as recognised here, are beginning of an individual as well as mutual process of domestication. The behaviour in interior space ensues and persists due to the neighbourhood exterior. The involvement of exterior and interior is also stepped up by various types of inward-outward transgressions. The exterior neighbourhood space is reflection of the interior space, a carry over of the past, perception of future, or an extension of the present.

SECOND SETTING FOR HUMAN BEHAVIOUR : The Intermediate zones

The involvement of the exterior in the interior space is graded. There are two major types of grading mechanisms: Threshold areas and adjunct structures subsist on gaps and cleavages in the barriers of the interior space. The thresholds have a structural depth which alters the exchanges through it. Where such depths are inadequate abutting structures like a verandah, shades, etc. help the process of exchange. The barriers of the interior space are transgressed inward or outward distentions. Such entities have pronounced presence of both the exterior and interiors, such as: Chowk, Verandah, Chhatris, pavilions, Galleries, bay, oriel and Mashrabiya windows, etc. Both the types of zones provide an intermediate setting for human behaviour. Here one

can experience the exterior and interior concurrently and in a desired grade. These intermediate zones are always attached to the barrier system of the interior space that is always the peripheral zone. The exterior at the intermediate zone is relevant only as an adjunct of the interior realm. The spatial adjacency and temporal immediacy are necessary.

THIRD ARENA FOR HUMAN BEHAVIOUR: The Interior Space

The interior space is finite due to its omnipresent enclosure. The enclosure is however, relieved through the distentions (inward and outward transgressions) and through the exchanges taking place through the gaps and cleavages. The interior remains with the exterior and continuously it gets modified. Interior space has two distinct zones, the core and peripheral. The interior space is constituted by Six elements: the thresholds[1], its adjunct structures[2], outward[3] and inward[4] transgressions, the peripheral[5] and core[6] zone. The connections are:

Peripheral	Thresholds, Structures adjunct to thresholds, Inward transgressions, Outward transgressions
Core	Inward transgressions

The connections show that peripheral zone is very vibrant compared to the static core section. The peripheral areas allow wide variety settings for human behaviour but it is the core that supports very intense, private and intimate behaviour.

FOURTH SPHERE FOR HUMAN BEHAVIOUR

Fourth sphere for human behaviour in interior sphere occurs in virtual space. Here the physical presence of either the exterior or interior realms is made through notional representations. The juxtaposition of both, the exterior and interior spaces also could be in virtual reality. Such make-believe conditions have limited efficiencies, or very

concentrated space and time experience. Make-believe do mould the human behaviour with compact and direct effects. However, make believe effects are useful for their novelty.

Other indirect means of human behaviour are the 'expressions' through art, craft, writing, etc. Here the expressions represent a set of emotions and so are interpreted for the expression of behaviour. The exercise is likely to be very subjective, yet a mature culture offers some common insight.

HUMAN FACTOR

The human behaviour results from many individual factors, such as the cognition system, metabolism, past experiences, etc. Perception of things and happenings results from cognitive capacities, and physiological needs which are further moulded by the inherited (intuitive) and learnt (intellectual) faculties. The inhabitants behave in response to the presence of other beings as well as the nature of communication (expression and its perception) being used.

Responses of inhabitants are of broadly THREE types:

Physiological Responses: The Physiological responses at a very basic level relate to survival, health, well being and comfort. At other levels physiological responses include making expressions, conducting movements, and reaching out. Physiological Responses to the environment develop as immediate as well as historical effects of the climate. These also include the spatial occupation representing the 'dimensional manifestation of the human-body' and its 'task functionality'. Physiological consequences also depend on the supportive means available: for controlling the stability and mobility, for achieving comfort, for increasing the efficiency and productivity. The supportive means extend the basic sensorial functions like vision, hearing, touch, taste, etc. All types of physiological responses are affected by age, sex, level of adaptation, familiarity, consistency, variability, limb capacity, body-limb coordination, etc.

Psychological Responses: Psychological responses include body and the perception capacities, intuitive (inherited) and intellectual (learnt) faculties. Psychological Responses relate to perception, cognition, and the reaction mechanism.

> Perception is a process of becoming aware of the environment around, including other human beings, through the sensations of sight, hearing, smell, touch, and taste. *Cognition* is the mental processing by thinking about, remembering, or evaluating the sensory information.

> Response mechanisms are concurrently active with perception and cognition. Response mechanisms initiate mental and physiological processes, Physiological changes are both automatic or voluntary, or instinctive to intentional.

Sociological Responses: Sociological responses involve inter-personal and group behaviour dynamics, expression and communication. These responses pose a very complex spectrum of human behaviour. Sociological responses reflect the social needs of the occupants and also awareness of their implications. The space, environment and the inhabitants together foster a social-contact mechanism.

HUMAN BEHAVIOUR

Human behaviour is apparent at three distinct levels:

1   Lone inhabitant
2   Individuals in a group
3   Group-based behaviour (collective behaviour)

Inhabitants of the space are primarily individuals, individuals in a group, or through groups with various degrees of affinities. Inhabitants respond to space and its environment as a composite happening but individually. The behaviour setting for individuals seems more complex when intra-personal dynamics (between individuals, between members-participants of the group, and between groups) are considered.

● Behaviour of lone habitant of a space depends on personal factors like pre existing psychological condition, physiological make up, nature of

the space+environment setting, experience, sequencing, personality build-up, cultural background and the task being handled. The behaviour is also reflects the social responses as seen from habits, routines, customs, taboos, etc. Behaviour of a lone occupant is often inconsideration of other absentee human beings.

● Behaviour of individuals within a group is formed by the person own-self or, through personal factors like degree of social familiarity, commonality of purpose (affinity-kinship), similarity of age, sex, physical features, notions of intimacy and privacy, etc. It is also moulded by the personal comfort (adaptation or acclimatization), familiarity of space and the environment make up, the duration of space occupation and degree of inhabitation, sequencing of experiences, the capacity, means and opportunities of expression, etc.

● Group based behaviour is generated for many complex factors. It is also cumulation of individualistic behaviours, affective as a set of affinities of a loner or rebellious mass hysteria. Group based behaviour in context of different persons is unique. Here the space and environmental setting (sharing the same domain) remain consistent but other variants play an important role, such as distance of interaction, position (orientation -frontal, sideways, backside), familiarity, modes of expressions of behaviour (such as posture, gesture) and the 'reach' capacities of the participants. In a group the perception capacity of individuals depends on their need for participation. Smart or experienced individuals enhance their projections (and there by participation) by exploiting the features of space and environment settings. Audio-video means and other virtual reality modes can intensely simulate identical behaviour in individuals that are separated in space and also in time.

Wild exterior spaces have potential for occupation, possession and habitation. Human behaviour if any relates to some search and inquiries which precede these actions. Without the consideration of habitation the human behaviour does not occur.

Neighbourhood spaces are both individual and community based. It is formed by the speculation how it will affect the others individually or the community. The neighbourhood space is a place to express various levels of intimacy, which results in privacy being offered to others while expecting similar treat for own self and family.

Interior Spaces are conditioned by Inhabitants, Environment and Space. It occurs in a very shifting situation due to factors like personal attitudes, group behaviour mechanisms, metaphysical effects, interpretations of metaphoric elements, environmental changes (routine and unpredictable events). The behaviour in Interior space also occurs in a fairly ordered setting where the family is consistent, reliable and predictable, the built forms are fairly long lasting, and the interior 'enrichments' such as the furniture, furnishings and amenities are functional and chosen with experience. The inhabitants project a cohesive and consistent style of living. The style is resilient so accommodates vast range of variations. Furniture, furnishings and amenities are the first to get changed, and these tend to be variable, relocatable or have the multiple functionally. Such variable elements are also used to reformat the spatial qualities of Interior space.

9 MANIFESTATION OF BEHAVIOUR

Human behaviour is evident in many forms due to different contextual conditions. Some forms of behaviour are intentional, in response to a trigger or need. However, certain biological reactions are unintentional. Behavioural changes are apparent to others as macro or micro changes in accumulated form, or sometimes as a recurrent affair.

A person, when faced with a specific situation or experience, behaves in a unique manner. Such behavioural responses are broadly of three classes: Physiological responses are evident as postures and gestures, Psychological responses are more subtle and related to instincts, motivation, etc., Sociological responses relate to the intra-personal and group relationships dynamics.

Behaviour of a person reveals the level of adjustments, adoption, comfort, need for change, nature of inter-personal relationships and degree of exchanges with the space-environment settings. The behaviour is also conditioned by the culture and geopolitical surroundings, and can project different meanings to others.

For a space designer the study of behaviour in response to space is very useful because as it indicates how a person will respond to a given setting. Alternatively one can predict how an individual or group will behave in certain setting. The two-way exchange between the space and the person is so rapid that is not possible to separate cause and effects.

At another level human behaviour is the basis for group behaviour dynamics. The level of reactivity within a group is defined by mutual perception of the behaviour. Similarly the recognition how a space-environment setting carries different notions to different people, helps group interactions.

A space-environment setting is an ever-changing enigma. A space characteristically static, seem to vary due to the environment. The space-

environment conjunction poses an ever evolving relevance to the habitants. To the habitants it provides scope and opportunity for personalization. It is also a way to perpetuate a space, or valid for a long time. Without some degree of personalization, space occupation, possession and inhabitation are not possible.

Habitants accept and appreciate a space-environment setting, by possessing it and extending the stay with personalisation. A well appreciated and accepted space is rarely conserved or sustained in the original form, it continues to get improvised or altered by circumstances and habitants.

FORMS OF BEHAVIOUR

Shift in Space : One of the most perceived form of behaviour is the shift in space. The shift in space is the change one causes in own-self or the surroundings. The shift in space is made to gain a relief and to recast the relationship with the surroundings including other beings.

Change of orientation: The primary shift occurs through change of orientation vis a vis an object, human being or a natural force (energy). The shift in orientation occurs by realigning the nodes of perception, such as turning nose towards or away from smell, view or ignore a sight, etc. It also occurs by being aware of a thing.

Orientation of the body: Orientation of the body, of a limb like head and of the sensorial nodes like eyes, ears, nose, etc. are both different and synchronous phenomena. One may talk to other but avoid a square face to face position.

Chiefs of nations seat side by side at approximately 150° angle which allows them to ignore as well as interact selectively. In a stage performance actors often speak towards audience for preaching dialogues, and to each other for sentimental deliveries. Boss wants a secretary, stenographer or colleague to sit on the side rather then on front side.

Change of place: One changes the position and orientation frequently to calibrate the relationship with people and objects. Shifts are subtle to

more elaborate, like a change of place. From the point of arrival starts a search for destination, a place to confront objects and other beings in the space. The process reflects the attitude of a person through the gait, speed, clarity of the purpose, postural and gestural changes, etc. One can perceive and schematize the approach by promotive as well as hindering means.

Anchoring to a place: In a space one needs to attach to a place. So on entering a new space or when behaviour must be recast one first shifts the orientation, and then moves and searches for a place mainly to anchor. By repositioning one vitalizes the relationships with objects and other beings. A strategy of behaviour is planned for objects and other beings who are already present or their presence is envisaged. One needs a mark to position own self. The markings are found in spatial elements like a barrier, an edge, a differential in environment, a pattern, objects, amenities, facilities, nodes of services, other single human being or in groups. Other markings are metaphysical elements and metaphorical presences. A designer recognises such entities, or implants them to make a space inhabitable or even hostile.

Sequencing in space: Behaviour in space is one momentum where one continues to shift in a planned or unplanned manner. Shifts are sequences of actions timed to match other happenings or to last for a duration-cycle. The unplanned sequences are exploratory or reflect compulsions to remain present in spite of intense discomfort.

Movements: Movements are Active or Passive. Active movements are produced by own muscles to move a body's part, whereas passive movements are made by an outside force and without the participation or effort by the person. In both cases the distance, speed, and direction are important. Gravity related movements are of three types: parallel, against or towards the gravity. Of these, towards the gravity movements are passive, because these can be made without muscle activity. Other passive movements are like the reverting positions, where a stretched muscle 'relaxes' to its normal position. The aid of tools amenities,

facilities, structures, etc., are required for passive movements. Infirm and aged people rely on these when their own muscles become weak or are incapacitated. Physiotherapists use passive movements to regain the muscle power. Socially any assistance for active movement hurts personal pride. Similarly physically disabled people do not prefer marked passive movement's facilities for them.

Aids for posturing: A posture often requires support, aid, or simply a physical closeness (as an assurance) of tools, amenities, facilities and structural elements. Support structures may not be versatile enough to provide all the required proficiencies. Some degree of personal adjustments is required to achieve the intended purpose. To attain and continue the posture, one needs support from other means. Real supports are like: tools (walking sticks, shoes, etc.), amenities and facilities (architectonic elements, equipments, furniture, furnishings, etc.). Virtual supports are abstract: such as the required environmental conditions and psychological sureties that in need these are available in the vicinity.

Postures: Postures are required for change, relaxation, transition, exercise or activity, for conducting tasks, communication and interaction. One uses body postures with and without the tools, amenities and facilities. Posture could have many variations within a basic theme. The variations are micro changes of the body that help tune in sensorial perceptions. Postures create empathetic and confirming images. Certain body positions, patterns and movements suggest specific emotions. Postures directly and abstractly convey the state of interpersonal relationships, social standing, personality traits such as confidence, submissiveness, and openness, current emotional state and temperament. Postures are also used for offensive and defensive and noninvolvement purposes.

Posturing is using own body limbs and sensorial nodes in coordinated manner vis-á-vis another individual, groups of persons, or the elements of the space. One can also reposition the objects and reshape the surroundings, change the environment or force recast the connection

with other beings or group, and thereby avoid some degree of posturing.

Postures resist or follow the gravity by exploiting or overcoming its effects. Some postures use resisted movements.

Free active movement is used by a person to overcome the effect of gravity, for example rising from lying to seating.

'Resisted active movement is used by the person to overcome the effects of a manual or mechanically applied force, for example, lifting a load, closing a door, using a knife and fork, or digging with a spade'.

Posturing helps one control incursion by others into the personal domain of behaviour, as much as it allows one to project a participating personality.

A podium or a front desk is a very assuring platform for a speaker, but shields the expression through body language. A leader, on a higher platform, controls the assault from the audience, and thereby dominates. By standing against a wall one assures that intrusion from that side is blocked, but by occupying a corner one limits the escape routes. Sitting in an aisle seat (In comparison to a window seat) allows one the postural freedom, but makes one prone to disturbances. Front benchers have to be attentive. Occupying a geometrical centre or a spatial focus automatically enhances the interference.

Open body postures: An open posture is one in which vulnerable parts of the body are not covered. Some important elements differentiating an open posture from a closed posture are the position of hands, fingers, feet and head. Open posture is perceived as a friendly and positive attitude. People with open body posture are able to carry out multiple movements such as body movement while shifting the gaze.

A chair with arms rests, railings, bus or railway hang-straps encourage open posture. A moving object like a bus will not allow closed body posture. A deep seat that allows stretching of legs and excludes the crossing of legs, supports the open posture. A stool seat (without back) allows one to lean forward as an open posture.

Closed body postures: It is one in which vulnerable parts of the body are obscured and protected by both humans (as well as animals). The body parts are: throat, abdomen and genitals. For humans arms crossed on the chest or abdomen, hands clasped in front of the genitals, and

crossing of legs signify closed postures. Showing the back of the hand or clenching hands into fists may represent a closed posture. Hands clasped behind the back may also signal closed posture even though the front is exposed because it can give the impression of hiding something or resistance to closer contact. Closed body postures give the impression of detachment, disinterest, unpleasant feelings and hostility. Similarly clothing may also signal closed posture such as a buttoned suit, or a handbag or briefcase held in front of the person.

Sitting on the side of a fairly wide chair, leaning too much on one of the armrest, sitting upright (without touching the back) in an easy chair, sleeping very straight in a bed, keeping hands in pockets of the garment, are some of the signs of closed body postures.

A person with a higher position nominally takes a more relaxed posture that seems to be less challenging, often sits down to talk. Whereas a person with a lower position, often maintains balanced or formal posture by placing both hands on the lap or at the sides and may remain standing until asked to sit.

Eye level and its focus are some of the most important means of behaviour exposition. Eye level and focus related physiological deficiencies can be corrected through appropriate postures. Postures can increase the distance and help de-focus the 'gaze', by taking a side seat or stand or by seating behind a desk. Often the opponents are disadvantaged by offering an uncomfortable seat, a seat lower in height and placing them in a non-axial position. Opponents are discomforted by providing them a fixed position with little or no chance for sub-posturing, like very narrow space, unbalancing, scary or distracting position. One, as an opponent can correct such conditions: by sitting or standing upright, by aligning body and sensorial faculties in the same direction, by heavily gesticulating, and raising the voice.

Inclination of the body. During conversation, a person unconsciously inclines or moves body or head, either close to or away from the opposite person. The action depends on the sex and age of the opposite person and the nature of the topic. An inclination towards the opposite person can be an expression of sympathy and acceptance, whereas moving or

inclining away can show dislike, disapproval, or a desire to end the conversation.

An intense conversation with heavy gesticulation or posture changes can be subdued by adding to the distance between the parties. Deep seating or reclining elements and mirrors not only reduce gesticulation, postural changes but also intensity of conversation. In waiting rooms seats are distanced and do not face the receptionist. A TV monitor that shows the class or office space disciplines the users.

Synchronous or empathetic behaviour: During intense conversations participants have tendency to imitate each other's behaviour. They emulate postures and gestures. Such synchronous behaviour encourages deeper relationship, provided necessary support means are available. Correct distance, equalized ergonomic facilities, nonspecific environmental conditions are some such means.

Designing for postures and relevant behaviour: Normally a designer designs for important poses of behaviour sequences. But some flexibility within the postural pose is required. The flexibility relates to minor changes for relaxation, resetting the body rhythms and facility to conduct momentary postural variations. A chair that is slightly wider or lower, a bar stool with a foot support ring, a seat with multi flexural (revolving, tilting, rotating) adjustability, TV or monitor swivelling stands are some of the examples that allow flexibility.

Postures are axially balanced or skewed. Balanced postures are mirror-image (congruent) postures, such as equally posed two feet, two hands, etc., or are normal like the frontal face, upright torso, erect neck, straight eye level, etc. Skewed postures reflect a readiness to transfer to another posture, due to shift in interest or saturation of boredom. Both, the balanced and skewed postures, are unstable and cannot be maintained for a very long period. It is better to design some support system. In the first case the support must be subtle almost imperceptible, but in the second case the obvious support system should be obvious but a casual one.

Office executive chairs allow great many postures, due to the width of the seat, height of the seat, height of the handles from the seat, depth of the handles (elbow or arm

accommodation), inclination of the back (tilting), height of the back (mid spine, shoulder support, neck and head support), swivelling, etc. Other postural options are provided by the table top height from the ground and seat level of the chair, depth and width of the table, nature of foot rest, task being handled, mobility of the chair (depending on the quality of wheels and flooring surface), etc. The site and its environmental conditions also play their role, such is the chair close against a wall, against an open space, facing a barrier or an open area, the source of illumination and air handling devices, one sided or multi directional interaction, communication devices being used and duration of work.

Similarly ordinary people exploit their familiar or novel seating systems for many postural positions that are for behavioural setting. Where possible a person would choose an appropriate seat with reference to the host or other participants, own social status, own psychological make-up, presence or absence of intervening elements, angle, level and distance of the encounter, level of comfort and formality desired. Next strategy would be for macro or micro shifting of the seat. Where such devices are lightweight mobile, micro shifting for angular and distance adjustments are done, but such choices are usually limited. Other strategies will include body or postural accommodation, such as seating by fully drawing back or upright, leaning on, one of the arm rest rather then a balanced posture, keeping arms on armrest, lap or any other front side device, placing the legs under the seat, straight-up, seating with cross feet or leg, seating frontally but looking sideways.

Flexibility can be defined as functionality to move a part or parts of the body with a controlled ability and mobility. Such movements are micro that is temporary and short in spatial reach. Such functionality is often aided, like a swing, or auto vibratory.

Gesture: Gestures are articulated with the hands, arms or body, and also include small moves of the head, face, eyes and nose (winking, nodding, twitching of nose, or rolling of eyes). A gesture is either speech related or a speech independent body movement. Speech related gestures are used parallel to speech, but provide supplemental information. The intention is to reinforce the message that is being expressed. Speech-independent gestures have a direct verbal translation. A wave hello or peace signs are examples of speech-independent gestures. Gestures such as dance Mudra represent very abstracted information that is relevant to a culture specific group.

Gestures could be categorised into many types:

Emblems are gestures with direct verbal translations, such as a goodbye wave, thumbs-up, Namaste. shrugging of shoulder (don't know), headshake (negation), or head-nodding (affirmation).

Illustrators are gestures that depict what is said verbally, such as in story telling, turning an imaginary steering wheel or running.

Displays are gestures that convey intensity of emotions, like a smile, cry.

Regulators are gestures that support the interaction.

An adaptor is a gesture that facilitates the release of bodily tension, such as yawning or leaving a breath.

10   EXPRESSION AND COMMUNICATION

Expression is a involuntary and intentional way of venting the emotions, Involuntary expressions are reflexion of personal behaviour. Involuntary expressions are often so subtle that neither the person expressing nor the party perceiving it are aware of it (only a under anaesthesia or hypnotism one may recollect it). Involuntary expressions (some are of biological origin such as the metabolism, etc.) have very complex origin, not all aspects of it have yet been known.

Expressions used for communication are intentional, and which may not occur for any particular audience. Expressions for aesthetic satiation are always intentional. Expression for aesthetic satiation occur through representative forms like singing, writing, art, craft, etc. The intent here is communication of an abstract content, either for personal satisfaction or an audience.

Intentional expressions have a purpose of informing, recording, recollecting, inciting, convincing, putting forth an argument, generating a feedback, forcing showing feelings, ideas, thoughts, opinions, re-experiencing, recollecting, abridgement, elaboration or re-enactment of a happening.

Expressions occurring through the body's gestures and postures, are perceived by others. However, one may try to conceal or suppress such a display. Expressions are sometimes masked or moulded by postures and gestures, but with the help of spatial characteristics, architectonic entities, environmental elements, amenities and facilities. Expressions can be also time-managed by rescheduling that is hastening or delaying the effects.

Expressions for communication must be efficiently conveyed and adequately registered. Intentional expressions get improvised the moment a perceiver shows reactions. Though expression, communication and its perception may not happen in same time or space. Expression for posterity are recorded as writing or image creation, broadcast through a device or recording on a media.

Expression and communication both must occur under certain protocol and situational conditions. A space is confirmed (accepted) or designed for such a purpose is a behavioural setting. One intuitively exploits the current spatial assets and environmental provisions, and then consciously continuous to modifies it.

Expression and communication need Functional elements such as: tools, amenities, facilities and structures. The Characteristic style of architecture and interior configurations inspires many to express and communicate. The Environmental conditions like illumination, acoustics and comfort affect the nature of expression and thereby the communication. Expression and communication are personal processes and are in consideration of Physical characteristics of the participants such as age, sex, experience, body posture, mental adequacy and maturity, time and distance, nature of need, compulsions, disposition, etc.

Expressions are aided by the contextual conditions like spatial form, shape, size, scale, environment and surface materials. Other aids include referencing through position, orientation, background vs foreground, angle and nature of perceptibility, degree of sufficiency for various body functions (reach capacity, comfort, metabolisms, etc.). These aids simplify, amplify, de-intensify, amalgamate, compact, quicken or retard the rate and contents of expression. In absence or dilution of these 'effects' the expression may not be very operative.

> One may make an intentional expression by using body gestures and postures but additionally support it by other sensorial means like vocal and touch. Non-personal or absentia expressions through remote means like telephone, broadcasting or publications use various means of emphasis (or even diffusion) (repeat, highlight, placement, emphasis) to support the expressions. Like for example, speaking face to face or frontal-way is a very direct but can be diffused by slightly off-centric or angular dealing. Similarly a superior delivery position, a static and clear background, appropriate lighting, clothes, etc. reinforce it.

Expression manifests as behaviour. 'Classical' expressions occur within a geographical-social-political groups due to the very intense and frequent

usage. These are abstract and brief due to their heavy reliance on metaphoric vocabulary. Expression as an impromptu process is accompanied with use of learnt or improvised behaviour. 'One emulates a child by mirroring the behaviour'. Behaviour of communicators during the interactions, are made up of factors like: transaction to be one way or two-way, communication to be 'one to one' or 'one to many', use of feed-forward and feed-back mechanisms, etc.

Act of expression allows a person to organise and rationalize the thoughts, and format the contents. The act of expression also allows recognition of time and space. It allows one to emphasize and de-emphasize whole or parts of the content.

Privacy and being in public are two considerations for the process of expression, conditioned by the system of cognition. Visual perception is key to remain concealed or be open. The visual perception is aided by factors like illumination, brightness, contrast, clarity of colour (hue, tone, texture, etc.), the distance and position (angle) of the expression originator as well as of the perceiver.

> At night clubs and other social gathering places, personal privacy is provided by darkness and preference for black dress. It encourages free expression. Whereas ball room dances and parties are brightly illuminated, so that everyone is able to see others' expressions. Indian classical music artists prefer audiences to be visible.

COMMUNICATION

Communication is a two-way process, where the participants share a modality and so are interdependent. Communicators as participants are both senders and receivers. Communication occurs when both, the sender and the receiver are either in the same or in different time and space. Intra personal communication, occurs in the same time and space, and allows both the parties to 'read' each other. Indirect or remote communication is where the time and location of the sender and receiver are different. The perceiver has no means to know how the expression was created, though the receiver is sometimes able to judge the state of the creator.

Communication is in direct and indirect channels. Direct channels are under control of the sender and receiver. Direct channels use verbal, and non verbal means. Indirect channels are not under the direct control of the sender, but are recognized subliminally or subconsciously by the receiver. This includes kinesics or body language that reflects inner emotions and feelings rather than the actual delivered message. The receiver may call it a gut feeling, hunch, intuition, or premonition.

Non verbal communication include postural, gestural and other (endocrines) features: like: facial expressions, eye contact, controllable body movements, metaphoric associations, sounds, odours etc. Non verbal communication also occurs through objects and metaphors, like: clothes, hair-do, architecture, interior, furniture, furnishings, arts, crafts, colour combinations, lighting ambience, signs, symbols, graphics, typography, etc.

Non verbal communication during the interaction operates in the context of the environment, the physical characteristics of the communicators, and the behaviours of communicators. The environment includes elements like furniture, architectural styling, interior decoration, amenities, illumination, acoustics, and temperature; the physical characteristics of the communicators include their age and sex differences, experiences, body posture, mental adequacy and maturity, time and distance as available, nature of need, inclinations, etc.; the behaviour of communicators during the interactions, are made up of factors like: transaction to be one way or two-way, communication to be one to one or one to many, use of feed-forward and feed-back mechanisms, etc.

Dance is a metaphoric form of nonverbal communication. It can be abstract form of self-expression or a very formal vocabulary of movements, steps, postures, mudras, gestures additionally supported by musical rhythm or Tal-beats. Though all these can become so abstract that there is lot ambiguity and personal meaning.

Verbal communication use spoken words or language, and also written and other textual forms of expressions. Verbal expression is substantially coloured by paralanguage and prosodic features, like the voice quality, rhythm, meter, intonation, stress, pause, emotion and speaking style. Textual expressions have elements such as presentation style of handwriting, graphics, typography or calligraphy.

Use of expressions in communication is by the originator alone in one-way systems compared to two-way systems where both the originator and receiver are involved. Though in one-way system with direct channel a lecturer improvises on perceiving the reception by the audience. The feedback may not occur as an expressed communication but rather as a cognition of expressions of the audience. In one-way system with indirect channel like radio and TV talk shows create such feedback by having a small set of audience within recording or broadcasting area.

A person looking through a small opening can see the expression of the others but others cannot read the expression of the viewer. Opposite to this stage performers often use larger lip, eye and other facial gestures so that furthest member of the audience recognises the expression. Such expression may look 'loud' or abnormal at close distances.

For communication, two way system with direct channels succeed when expressions of both parties are mutually recognised. But for this the communication should occur under certain protocol and situational conditions.

A lecturer or a performer is perceived, when on a podium (well positioned), with frontal illumination (well lit), clean and contrasting backdrop (sharp silhouette form), availability amplification devices (sound enhancement by architecture design or electronics), good acoustics (reduction of background noises and reverberation reinforcements), use of gesture enhancing enrichments (robes, sticks, batons, cap, etc.). But for the reverse feedback from the audience following parameters need to be fulfilled. Audience should be at the same level, well lit but slightly from sides (rather then top down), complete absence of background noises on performing stage, minimised movement within the audience (seated rather then standing), non distracting colour of seats (for unoccupied ones).

In offices and conference rooms bosses want their assistants, secretaries and juniors to seat or stand on the (right-side for right handed) side, but never on front or back sides. For a *one to one* meeting between two equals separate seats placed an angle of 145° to 160° is considered

a correct protocol then seating on side by side and on the same seat. A physician wants the patient to sit on the side rather then front. Entry to office cabin must be from the front corner. Similarly distance is important determinant for communication. In one to one meeting too close a distance leads to intimacy but loss of privacy and objectivity. Too much a distance increases dilution of communication and also alienation. This happens over very large dining tables, where to avoid an unwanted neighbour one must talk to the person on the opposite side, but never with due intimacy and privacy.

A flat edge meeting table or dining table does not breed homogeneity as much as a slightly curved table can do it. A square table conference room divides the audience into artificial classes, a round or oblong but closed ended table creates an artificial classless unity. UN uses horse shoe (open ended) table for security council. US president occupies an oval shaped office occupying one centre of the eclipse leaving the other free (and so often challenged by the person who can dare to stand there and communicate from that much distance. More over US president has an advantage of a secure back drop compared to the possible challenger whose back is open and vulnerable.

Two way system with indirect channels are like telephone, where one may not be able to judge the behaviour of a person at the other end. Chat rooms of social media sites also function similarly. Interactive TV and radio programmes like breakfast shows have partial two way systems. Here the programme conductor controls the participants feed-in.

Animated behaviour is used for projecting certain acts and emotions. During interactions, such as one to one talk or public address one uses gestural and postural behaviour to reinforce the vocal message. These happens when one may not immediately recollect or be aware of the correct words, literary expressions or the vocal intonations necessary for the vocal expression. Similarly postural and gestural reinforcement is required for expressing in a foreign language, or audiences of different locality. There is also natural tendency to dominantly use gestures and postures as a behavioural expression while dealing with first ever situations. Such accented use of gestures and postures can be 'loud or gaudy' for certain social events, but can be subdued by extending the period of expression enactment. However, conversely one cannot hope to hasten the period of expression enactment by increasing the pace of animation.

At other level, a different type of behaviour pattern is seen. Social media domains provide such behavioural settings. Here individuals or groups dwelling in isolated domains and spatial-environmental settings are connected through various means, modes of expressions and communication protocols. The individuals or groups are unaware how the link or trace identities created by them pervades in the virtual space. Such realm have a space definition of a physical place, or are in virtual reality, and can have time identity of an era. The space and time definitions together provide a sense of belonging or idea of habitation (belonging). It is as ephemeral as various 'isms' that go around in the world of criticisms. When a happening is classed by critics, many perceive it to be an unique setting for behaviour. As some has said about 'isms' that 'it is an inflicted behaviour'.

Space and time overwhelmingly affect the human behaviour. The space as an interstitial element between humans and humans affects the behavioural expression.

> A mobile in pocket is a great assurance. A TV or radio creating some background noise serves warmth of a family. A picture of loved one or family portrait in hotel room or space module replaces the loneliness. People keep memorabilia for a very long time. Life-place memorial evoke the same sentiments.

At certain distance one feels invaded and in other circumstances same distance makes one feel lonely. Such conditions are due to the: age and sex difference, social stature, familiarity, perceptibility, postural position and difference of elevation, additional reach enhancing means, presence or absence of barricading and background elements. Space has another dimension, the convenience of reach. Whatever is within physical reach or nominal perceptive range seems to under control and therefore secure. Time relates to the gap between the first vocal expression and the non verbal behavioural expressions that precede the reaction. The speed and rhythm both depend on experience.

The physical distance is determined by the socio-cultural values as much as the climate of the location. The body heat, odours and other secretions how close one be with someone. Yet there are many postures that allow one to control the interpersonal reactions, such as Namaste, handshake, salaam, adaab, high-five, thumbs-up, holding hands, kissing (cheek, lips, hand), back slapping, patting the shoulder or head, etc.

11 PRIVACY AND INTIMACY

Behaviour in space is conditioned by two personal notions: Privacy and Intimacy. Behaviour first develops from the primary concern for survival. Survival is a defensive action where one tries to create a personal protective layer. It is also an offensive activity where people form groups, so as to be more accessible to others, and thereby create a common protective mechanism. Privacy and Intimacy are expressions of intra-personal relationships. Environmental factors affect their scale of manifestation. However privacy and intimacy, being simply notions, are not related to any specific spatial or temporal conditions.

PRIVACY

Privacy is a personal notion and is basically achieved by obscuring own self, or by isolating from people. One can obscure own self by merging with background or by becoming less perceptible. Isolation is achieved by barricading and distancing. A person or group achieves insulation through body posturing. By posturing one can adjust the exposure, control the communication, command the expression and re-calibrate the reach of the body as well as the sensorial perception. Privacy can help overcome many inhibitions through mental isolation. Psychological motivation helps one to ignore some of the side effects of lack of privacy.

Privacy provides the isolation whereas degree of interference by others determines the nature of intimacy. Both are important means for individualization or branding of unique personality. In a space, primarily one tries to anchor to a spot where privacy and intimacy are controllable. And whenever these are compromised one may try to adjust the posture and reorient and distance from others. People inherently discern their relationship with others in terms of distances or spaces between them. In other words certain quality of distancing from others is required for individualization.

One requires many different types of privacy: Physical privacy -against someone making a close approach (touch or near approximations), Visual privacy -to limit others' view of oneself, Audio privacy -insulation against being overheard and interference from background noise, and Olfactory privacy -that limits to reveal own physiological state or experiencing someone else's such a state through hormones-odours. Other privacy parameters include the body temperature, breathing rate, heart beats, pulse rate, vibrations of the body, sweating and perspiration.

VISUAL PRIVACY

Visual privacy addresses the ability to limit others' view of oneself. Inherent in human behaviour is the tendency to avoid situations in which one can be watched without being aware of who is watching. Visual privacy can be achieved through the use of furnishings, partitions or walls. In a private space or an office, people will often orient their desk in order to visually control the doorway and achieve a visually private space on one side of the desk. Similarly, people prefer to sit with a protected back, controlling the area they cannot see directly. In restaurants, the first seats to be filled are usually those along the walls. In outdoor spaces, people tend to sit against or beside objects such as trees and bushes rather than in the open.

In open office plans' a person is made to sit facing a wall or partition for lesser distraction from the back side passage, however, it is the unseen and unpredictable traffic on the backside that challenges the privacy. Contrary to this in garment stitching room workers are one behind the others and passage is on the side.

AUDIO PRIVACY

Audio privacy in an interior space results from effective treatment of the acoustic environment as an interrelationship of many components: ceiling, partitions, furniture, equipment, and floor. A complete acoustic system will generally provide adequate speech privacy. Speech privacy is achieved when there is sufficient acoustic shielding to allow conversation to be unheard beyond the intended participants of the conversation. A high quality of speech privacy will significantly affect the level of communication, social interaction, and productivity. An appropriate relationship between the background noise

and one that is produced within the activity space is conducive to speech privacy. However, complete insulation of a space, such as a study room, cuts-off the background noise, leading to loneliness or alienation. Hospital wards are hard finished due to issues of bacterial infections. The wards during daytime have high presence background noise that subdues or balances the noise from within the space. However, past midnight, in absence of background noise, the noise from inside the room becomes unbearable.

SOCIAL PRIVACY

Crowding occurs when personal space and territoriality mechanisms function ineffectively, resulting in an excess of undesired external social contact. Social privacy is often equated to 'crowding' in a space. It is reflected in degrees of accessibility a person or group offers to others. Crowding can have different meaning depending upon the situation. Crowding may be tolerated if it is temporary and for a definite purpose like for fun.

Crowding means heightened accessibility or reduced interaction depending on the need for expression, communication, physiological requirements. Crowding affects the sense of belonging for group behaviour mechanisms (common purposes, beliefs). In 'neighbourhood spaces' one wants to be away from the closed interior space and so here crowding of any type takes away the social privacy. The scale of a room it's size relative to the occupants also influences conversational distance. As room scale diminishes, people tend to sit closer together. Likewise, increased noise levels and distractions drive people to sit closer together.

INTIMACY

Intimacy is a feeling of closeness or affinity between a person and another, or an object. If privacy is personal as well as group-based requirement, intimacy is mostly an intra-personal affair. Intimacy is also a biological need. Intimacy is considered a product of distance, and it relies on compatibility, sexual

needs, glandular secretions, social acceptability, etc. It is an attitude, mental conditioning or mental posture. Intimacy could be one-way feeling that is without reciprocal feeling. For intimacy to flourish, privacy is needed. Yet one can be intimate with another person or group of persons without the apparent need for privacy. So intimacy is not always a function of physical proximity. One can feel close to a person who is long dead -an illusory presence or through notional links (clothes, odours, recorded sounds, etc.). Distancing is also a matter of time, like remembrances.

Other than security a person or group seeks privacy to flourish in an environment. It instills a sense of intimacy, a one to one relationship. An intimate relationship is with a person, but an intimate space is one where occupant and object have intense relevance to each other. A private abode is an own world. An intimate situation is safe, predictable and reassuring. Intimacy is like a domain where everything is under an exclusive command. Privacy allows a person to develop a distinctive identity. In case of groups intimacy increases the affinity, unity, communication and expression.

Privacy and intimacy are notions related to conduction of certain tasks. In appropriate conditions it is easy to control ingress, distraction and unwanted participation by others. These are achieved in several ways: by placing required types of barriers, by physical and metaphorical declarations of the territorial markings, by suitable space planning and style of space occupation. Group behaviour is defined by the nature of privacy and degree of intimacy that is available.

> Meaning of intimacy varies from relationship to relationship, and within a given relationship. Intimacy has more to do with rituals of connection. Intimacy is both the ability and the choice to be close, loving, and vulnerable. Intimacy requires identity development. Intimacy can have two main forms: emotional intimacy and physical intimacy. There could be other forms of empathy like cultural, intellectual, spiritual, social that are akin to intimacy in some conditions. Strategic relationship developed to take advantage of anyone could be very close but it is a make-believe intimacy.

DISTANCING FOR PRIVACY AND INTIMACY

Privacy is achieved by distancing from the threatening, disturbing or overwhelming elements. Privacy and intimacy both are determined by the distance one creates or perceives from other beings and objects. The distance from others is perceived in terms of space, intervening objects, physical reach and perceptibility. Distance is required to conduct tasks and for communication and expression. Distance is governed by environmental factors, social requirements, psychological make-up, time duration and the relevance of objects and people. Interpersonal distance refers the range of distance between two or more people required to be maintained for meaningful communication. The interpersonal distance may vary with culture. Sociological determinants such as group dynamics and communication also affect personal interactions within an environment.

Edward T. Hall defines four distinct distances at which interpersonal transactions normally take place: Intimate, Personal, Social and Public.

Intimate distance is used in intimate relationship such as for embracing, kissing, touching or whispering and ranges from 0 to 450mm.

Personal distance is useful for interactions between good friends and family members and ranges 450mm to 1200mm.

Social distance is for interactions between social acquaintances and its range is from 1200mm to 3.5mt

Public distance is mainly for public speaking and is above 3.5mt.

SPACE - DISTANCE DEFINITIONS

Distance also means the size of intervening space or affective extent of space. Some Space Distance definitions are:

Intimate Area: There is a very Intimate area close to the body, within which it is possible to have physical touch, non verbal communication and emotional interactions. To gain such an intimate position one needs to be familiar with the other person or coerce. Even in the intimate space close to the body, the nature and level of intimacy is affected by the attitudes of the persons involved.

In case of objects such as tools and support systems are intimate. Here due to the intimate relationship one senses the texture, temperature, moisture, vibrations, energy, etc. One has to be very sure that by using these no harm will occur.

Personal Area: There is an area immediate to the body that marks the Personal area. It is a zone of regulated and selective participation. This is an area where one can reach out through projection (expression), channels of communication, physically (through body limbs) or stretch out with gadgets (walking stick, stethoscope, etc.). Here the intimacy is regulated but it is not a private affair, unless some screening barriers are used to achieve the privacy. One can dwell in a culture or state formed of metaphysical elements (beliefs, customs, etc.), to achieve the same.

In case of objects that are personal are not shared with others or its use is restricted. Others also sense such ownership or exclusive rights. The strong association to a person is imprinted on the object's form or position. Chief guests chair, head chair at the end of a dining table are such personal entities.

Nearness Zone: There is a zone of varying nearness. The nearness is defined by the position and duration of the eye contact, sound pitch and language call, olfactory sensation and body heat perception. The zone is used for sensing the time and space of happenings. The time (duration) and space (distance), are used alternatively to compensate the other. This is a zone of participation without personal involvement. It is also called a non-committal area.

As per the protocol, leaders of the two nations never share a seat, but rather occupy separate seats distanced with a small table or flower vase. Similarly deputies accompanying their leaders, are made to sit at some distance, from where they get a sense of participation but have no chance of intervention. On public platforms one intentionally uses lower sound pitch to draw attention. On very large dining table one can effectively hold conversation with members sitting on the two sides, but not across the table. In gatherings one uses differing sound pitch to reach desired distance.

Reach Zones: These are within the domain that one occupies. Though these are not within an anthropometric ambit, but one can if required 'reach' out. Such zones are marked by a predominantly assigned task, such as dining area, entrance, cooking, study, etc. Zones like prayer area are marked by the associated sanctimony. In reach zones intimacy or privacy of personal nature is not available, yet one can announce it through metaphoric presentations. Reach zones usually have one consistent environment. Such zones are unitary spaces and so there is a sense of belonging, safety, security and personalized identity.

Neighbourhood areas: These are spaces beyond the current domain, like the street, neighbourhood, and such public areas. Here the 'privacy' is afforded by the familiarity of the surroundings and security of nearness. These areas have intimacy of the distance such as within the visible range, reach of shout or call, and the odour. These are part of the 'home' setting. Such public areas foster non-intimate group behaviour. Mothers allow children to play in these spaces, as these are under surveillance.

Domain edge zones: These have personal relevance so far as there is a link active in time and space. It is a place for a sporadic encounter, however effects of which could persist as a remembrance or experience. Frequent occurrences belie a consistency or permanency. It functions like a networked zone (web) where something relevant is always

available. So no matter where a person arrives, it begins to manifest familiarity or is pregnant with possibilities.

TERRITORIALITY AS A DECLARATION OF PRIVACY

A person or group carves own space by different territorial markings. The territorial markings such as of physical, metaphysical, and metaphorical nature present spaces of many different characteristics. Territoriality is a means of achieving a desired level of privacy. It involves creating and maintaining an exclusive control over a space by an individual or group. This control implies privileges and may involve aggressive actions in its defence. For the individual, territorial control provides security and identity, and is communicated through personalization and definition of the space. For the group, territorial control, is the cause of their being an entity, and is expressed through the common behaviour.

Hargie & Dickson identify 4 spatial territories:

Primary territory: This refers to an area associated with someone who has exclusive use of it. For example, a house or a farm that others cannot enter without the owner's permission.

Secondary territory: This is like 'social' sharing territory. There is no right to occupancy, but people may still feel some degree of ownership (belonging) of a particular space. For example, one may sit in the same seat on a train every day and feel aggrieved if someone else sits there.

Public territory: This are public spaces that are available to all, but only for a set period with conditions. Such as a parking space or a seat in a library. Although people have only a limited claim over that space, they often want to exceed that claim, to show their interest in it. For example, it was found that people take longer to leave a parking space when someone is waiting to take that space.

Interaction territory: This is space created by others when people are interacting. For example, when a group is talking to each other on a footpath, others will walk around the group rather than disturb it.

SPATIAL MANIFESTATIONS OF INTIMACY

The need to be alone or be part of a group arises from factors like personal (psychological and physiological), intra-personal (communication, exchanges)

and group behaviour mechanisms (sense of belonging, sharing, participation, confirmation).

For an individual the space that permits one to 'distance' from others is a private space. However, for a group, a space that allows easy communication and recognition (without any aids or extra strain) are intimate spaces.

Enclosing space forms (corners, cones, concaves) force individuals to be closely spaced and be intimate enough to form a group.

Crowded spaces force intimacy of coexistence. The coexistence may force an individual to mentally barricade own-self or open-up.

Some environmental and other effects are highly focussed (illuminated spot, under the fan area, sunny patch, breezy path), force a group to share the same zone and so breed intimacy.

Eye contact could be both intimate and non-intimate. A direct eye contact allows better nonverbal communication (empathy), but a direct eye contact also subdues the other person and thus is less-intimate. Persons meeting in one to one setting are more intimate, than their encounter in public presence or a gaze.

Audio intimacy occurs over a chat on telephone or mobile, web chatting, videoconferencing. These are forms of being audio intimate.

Virtual proximity Intimacy is also achieved by entering into some one's private domain like home, a bedroom, toilet, study area. Homes and work places of great persons provide illusion of physical intimacy.

A person projects privacy and intimacy in various proportions, whereas the space facilitates various levels of physical closeness, isolation and insulation. The mental needs ultimately define the degree of involvement. The culture defines the acceptable or inappropriate types of intimacies. A crowded stair, elevator, metro carriage do not project an intimate atmosphere. A hand shake or hug nominally has no sexual meaning in many cultures. In some cultures privacy achieved by a veil is considered retardant of intimacy. Intimacy could

be a display or an expression with physical touch but with no apparent mental feelings.

> Two persons or members of a group can talk in whispers and give out an impression of intimacy in spite of the apparent distance between them. Conversely talk-discussions in high pitch could be used to present bonhomie and thereby a close-knit entity. Politicians and celebrities talk in whispers to state things that need to be made public and talk loudly things that need not be public, both ways they draw the attention. A public orator changes the pitch from normal to very low or high to draw the attention of the audience and thereby register a point.

SPATIAL SEPARATION AND RELATIONS

Hall (1959) has stipulated that spatial separation also serves an expansive function. He made a study of the spatial relations that seem appropriate to various kinds of interactions. They vary with intimacy, and depend on the possibility of eye contact. They vary with the culture.

> One can easily distinguish strangers from friends in an airport lounge. Strangers will keep a distance, taking alternate seats wherever possible. Friends tend to form clots, and families even pile one on the top of another. Total strangers will comfortably seat themselves only inches apart if the seats are back to back, but friends and the members of the family never arrange themselves in this way. Eye contact invites interaction and so is sought to the degree that intimacy already exists. (Hall E. T. 1959 The silent language).

Hall argues that there are spatial zones appropriate to various types of interactions. Though distances through virtual communication technology mediated interactions are likely to be different. Hall has also shown the cultural variations that South American needs much closer distance for impersonal information than a North American desire or is accustomed to.

Very close	75 to 150mm	Soft whisper, top secret
Close	200 to 300mm	Audible whispers, very confidential
Near	300 to 500mm	Soft voice, confidential
Neutral	500 to 900mm	Soft voice, low volume, personal subject matter
Neutral	1300 to 1500mm	Full voice, impersonal information

Public	1700 to 2500mm	Slightly over-loud, information for others to hear
Across room	2500 to 6000mm	Loud voice, talking to a group
Hailing privately	6000 to 7500 mm	Indoors, Loud voice departures
Hailing public	30.00 mts	Outdoors, Loud voice shouting, departures and calls

Impersonal discussion, takes place at 1200 to 1500 mm; cross the inner boundary of this zone and one's interlocutor will retreat; cross the outer boundary and will advance or subtly change the manner in which to behave adopting the pattern appropriate to the new distance. One can move from impersonal discussion to personal matter by reducing the distance, or to a non personal information exchange by increasing the distance. TV anchors do the distance trick on their show. For an intimate question the anchor pushes forward own body (Larry King of CNN), but as soon as the question sinks in with the guest, the anchor withdraws not just to the nominal position but little further backward. These distancing movements allow the guest to deliver the answer more objectively and the camera frames the guest alone for such a 'heroic effort'. However, a host may intimidate the guest by doing exactly opposite of this.

LONELINESS

Loneliness is an anxious feeling about a lack connectedness. It is experienced in absence or presence of people, and in known as well as unknown surroundings. The causes of loneliness are many such as social, mental, emotional, physiological and spiritual.

> Causes for Loneliness are: Loss of a relationship due to breakup, travel, death of a person, dejection or withdrawal from a social circle, enforced isolation like jail or punishment like over stay at school or workplace, unfamiliar lifestyle, food and community leading to home sickness, a dysfunction of communication channels at places with low population densities, during periods of harsh climates and fewer people to communicate with due to language, sex, social or other barriers.

Loneliness can be attributed to personal need, period, place and people. A person when isolated may feel lonely but to feeling of loneliness is not always due to isolation. Solitude could be by choice, and so loneliness is a subjective experience. People can be lonely in a crowded or public place, because a person may be desiring more intensive social interaction than what is currently available, or the surroundings are not suitable for such opportunities. A person can be in the middle of a party and feel lonely due to inability to participate in it. Contrary to this one can be alone and yet not feel lonely if there is no need or desire for social interaction.

Loneliness tends to depress some but improves the cognition and improves capacity to concentration. Study rooms, prayer or meditation zones, contemplation areas, private consultation rooms, lovers' corners in restaurants, back seats in assembly halls are designed to be less participatory. Such places of solitude or temporary loneliness lead to enhanced and creative expression. Solitude is also associated with spiritual and religious quests.

For solitude, other then isolation from people, some control over cognition may be necessary. However, complete absence of cognition or by totally filtering an aspect of it (such as sound, light, touch, smell, etc.) in a space may create an uncomfortable situation. Even in jails and study rooms some illumination, background noise, distant odours are desirable to maintain mental health. Loneliness should be considered as an alert that it is time to seek social connections. Connections of this nature, may not occur with presence of people, but rather by necessary adaptation of the living space.

Single people keep themselves occupied through intensive work regimen, audio and video intervention, mobile or other means of communication, by seating near a street view window, keeping a pet as company, frequent relocation of amenities, irregular work cycles including physical workouts, dancing, and cooking.

Russian space psychologists analyse the body language and tone of voice to ensure compatibility of crew members. Members of a group must have a strategy of a good working relationship. One may not be very friendly with a companion, but a clear understanding as to how much you are ready to share

and not share creates a healthy relationship. The Shuttle-Mir missions of the 1990s Russian and American crew had problems of language and other communications, leading to isolation.

Loneliness is going to be a major issue for long duration space travel with few crew members. For some persons the problem will not be loneliness but too much of the same company. The privacy of space may not be feasible, but of few exclusive moments will be appreciated.

Direct communication will not be possible for space flights. A radio signal can take up to 22 minutes to travel to or from the Earth. Two-way instant conversations will be completely impossible, so email and social media communication is likely to become inevitable. Both of these allow a degree of selectivity that it is not always necessary to respond, and your behaviour is not being visually exposed. With (as of now) poor condition of communication channels, most voice messages are truncated in bandwidths creating a phantom like effect, but belying the emotions.

It is extremely important to maintain the emotional ties to the ground (or enliven the past). NASA on ground station involves fellow astronauts who understand what the space travellers are going through. Loneliness is now being tackled by counsellors available on telephone and social media 24x7.

Loneliness is also an issue with elderly people, staying in Old-age homes, hospitals and alone. They need someone to talk and respond, visually see the company, and touch. A robot seal is designed to improve all such sensorial functions. Space travellers will perhaps have such robots.

12 TASK SETTINGS

Tasks are identifiable units of work at home or at places like office, industry, etc. Tasks require specific setting. Task settings are the parameters required to perform a task. The parameters include space forms, environment, time management, amenities, facilities, structures, enrichments and social interactions.

Tasks are repeating or unique. Main tasks have a basic module of work. Main tasks are purposive, so can be called productive, creative, or learning. Main tasks incorporate several processes, called sub-tasks. The processes or sub-tasks require a particular setting and very specific resources. Processes are both time and space dependent and also free of it. As a result some processes are handled without time and location compulsions. Such tasks also serve purposes such as relief, entertainment, social interactions, expression and communication. In other words sub tasks are physically invigorating and relaxing.

Tasks are strongly characterized by Time and Space. Tasks derive their efficiency through sequencing in time and space. Tasks are scheduled at a location so far as required parameters are available. However, tasks shift the location if the setting parameters vary in time. Tasks substantially dependent on the environment, shift with changes in breeze direction, shading, illumination, etc. Tasks requiring unique spatial qualities for creativity, relaxation, efficiency continue to flourish at a location till a better or exciting place or social accompaniments are available. Tasks that flourish within groups may even ignore time and space convenience.

Tasks have Three important qualifications:
1   Tasks are anchored to various entities,
2   Tasks shift around in time and space,
3   Tasks if routine, the efficiency of performance is critical and if casual, the relevance of the end product is important.

TASK ANCHORAGE

Tasks are attached to various entities like: space forms, environmental conditions, structures, amenities (these are attached to architectonic elements and are relocatable), facilities (these are integrated architectural configurations and are mostly fixed, but sometimes demountable), and other enrichments (these do not have apparent functionality but add specific character or interest to the space). Some tasks happen where there are chances of intra-personal interactions. Tasks occur at places from where some degree of command can be enforced over a larger domain.

> Bhunga houses have door thresholds as the commandeering location. Huts and one room house use inside front corner for cooking because from a door an outsider would not see what is being cooked. In pol houses the niche in chowk area is always under observation of the housewife as it is also location every member uses while coming in or going out.

TASK ORIENTATION

Tasks are mainly oriented to advantageous environmental resources such as illumination, wind direction, sunlight or shadows. Tasks are also oriented to amenities and facilities, architectonic elements and to other people. Some tasks have sanctimonious associations and so are oriented to specific directions (like Mecca, East-Sun). One of the most preferred of orientations is the openings' system like door, window, or a gap, because it extends the vision and allows to command further. Orientation is a biological preference as well as cultural conditioning and accordingly people prefer left or right turning.

TASK SHIFTING

Task shifting is both a necessity and reflection of insufficiency of the current location. In built-forms where environment is well conditioned, the need to shift a task is less severe compared to tasks that are dependent on climatic factors.

Similarly where a task for its creativity is extremely dependent on fixed amenities cannot be shifted. However, tasks dependent on multiple processes need to shift around wherever these are available. Tasks require different space spreads for various processes and may need re-siting. For task handling efficiency derives when wait for the right occasion or search for the right location is minimal. In other words, for shifting the realization must occur as early and near as possible. Some facilities are bounded amenities so some tasks cannot be easily relocated or rescheduled. Tasks are shifted for the sake of variety of experience and intra-personal encounters a new location offers. In single room houses, tents and non-formal work areas (like rural craft workshops), tasks' timings and their spread requirements are well matched.

Tasks are mostly positioned (and shifted around) within the same space segment and scheduled (and switched around) in the same time section. But some tasks are 'shifted to other space segments or deferred in time'. Such shifts in space and switches in time occur primarily for functional needs, but often to relieve the tedium and for experimentation. Tasks are also switched to different schedules and locations to develop new intra personal equations or group behaviour mechanisms.

ROUTINE and CASUAL TASKS

Routine tasks are associated to the same location and time schedule. Routine tasks are also very dependent on group behaviour dynamics besides the fixed structures, amenities, facilities and environmental conditions. Routine tasks require very little shifting or rescheduling, and so are very productive. The location is maintained because the space segment, with some consistent qualities can expand and contract to meet the occasional needs of the individual or group. Locations for routine tasks being consistent, evolve with a lot of personalization such as enrichments. Such locations, because of their consistency and permanency, become marked-out spaces, or architecturally defined units (bathing area, hay chopping area, etc.). Routine tasks with acute time domination cannot generally afford the luxury of space shifting, because identical environmental conditions are difficult to get elsewhere.

Casual tasks are tactical solutions rather then of any strategic planning. Casual tasks are 'once in a while process' and not the 'main task'. Casual tasks overcome the shortcomings of the space size, form, environmental conditions, and problems with group behaviour dynamics. The exigency is to accomplish the task in with whatever locational conditions, and as quickly as possible. Casual tasks make a space multi purpose and multilateral. Casual tasks are very exciting as these open-up new possibilities of space and time management. Casual tasks also generate new group behaviour dynamics and intra-personal relationships.

TASKS AND SENSORIAL PERCEPTION

The ability to see is one of the most important requirements of task handling. The critical factors are visibility, legibility and recognition. It also includes differentiation of spectrum variations or in other words colour perception. Vision also helps to mark a scale (perspective + distance) for objects. Persons with deficient or no vision, find it difficult to comprehend the environment. Hearing is also critical as it affects our ability to communicate. The important factors in human hearing, are the sound levels (db) related audibility, intelligibility, signal-to-noise ratio, and the capacity to attune the preferred frequencies, selectively (back ground noise and noise annoyance). Perception through touch is locational and varied which gives a choice what should be done with which part of the limbs (fingers' tips are more sensitive then any other part). Perception of taste and smell seem to go together, but smell has directionality taste activates metabolism and other systems. Task handling makes use of perception faculties to be productive, creative and non tiring.

PHYSIOLOGICAL DETERMINANTS OF TASKS

Physiological determinants relate to physical needs of the occupants. Major concerns are safety, health and comfort. Other minor concerns include functionality (anthropometrics, ergonomics), stability, mobility, consistency and variety, physical reach (depth and range of motions) and physical capacities.

Factors such as recognition, productivity, energy-conservation, ecological engagements, learning, taboo, etc. are not physiological but operate concurrently.

Safety concerns are focussed on human response to negative stimuli. When individuals sense danger, the first response is to eliminate the harmful conditions. One makes a defensive withdrawal an offensive fight. However, a sensible strategy and natural method for task handling is to isolate the condition by barricading or distancing.

Health or well-being concerns are often less obvious than life safety. But factors such as the purity of air (dilution of contaminants), volume of ventilation, moisture content, ion charges, illumination, allergens, pollution, affect the quality of life and productivity.

Comfort mainly derives from sense of well being. Comfort derives from ease of doing things such as perceiving and posturing. Perceiving is multilateral covering suitable illumination, acoustic adequacy, touch sensibilities and odour recognition.

Stability and Mobility are defined in reference to the gravity. Tasks that are conducted in plane with gravity are naturally stable. Mobility, is the capacity and need to move around. Tasks and its processes in very tight space locations or acutely defined environmental conditions are less mobile and should be of very short duration. Use of reach devices does not add to the stability or mobility.

Functionality of tasks is factored through interfacing of human beings, environment and tools+ equipments. It takes into account people's capabilities and limitations of sensorial as well as physiological nature. Ergonomics combines anthropometrics (human body measurement data), physiology, and psychology in response to tasks and the needs of the user in the environment.

Physical Reach and Physical Capacities are very important aspects of task handling. These define the number of sub-tasks or processes

that can be handled without requiring shifting or rescheduling, and the spread of task area. These two, in a way also determine the dependence on tools, equipments, structures, amenities, facilities for carrying out tasks. Physical reach and capacities are governed by the posture taken for the task.

> Housewives have accepted platform type of kitchen over floor level cooking in a crouching position because the later was restrictive. A corner study table allows greater reach then a straight table. An aged person prefers a straight seat with handles as it allows an easy rise up off the chair.

MANAGING TASKS

Task Recognition makes way for efficiency and productivity. Tasks need to be recognized in terms of its possible location and ideal schedule. Tasks are better managed in a continuous sequence. The sequence optimises the postural change, site shifting, usage of amenities and facilities by multiple members, exploits the environmental advantages, adjusts the intense work and rest periods.

> For example for cooking an efficient work triangulation is proposed, the nodes consist of basic amenities like cooking, sink and refrigerator (could change with culture and technology) and the connections denote the preparation, defrosting and storing, respectively. Similar task management techniques of robots are used for automobile assembly lines. Streamlined production plants like garments, electronics, consumer white goods recognise working of each task and the interim carryover periods and spaces.

Consistency and Variety in task handling are required whether human beings are involved or not. Human being needs to escape out of the tedium and also rest the limb and the body. It can be achieved by doing a different task or the same task differently. For these tasks are placed in different spatial and environmental conditions and often with new intra-personal setting.

Task Productivity is greatly affected by the work setting formed by the space and environment. Wherever and whenever there is realization that task productivity is not of the comparative social standard, the space is

reformatted to realign the amenities, facilities and architectonic elements. Here at one end, the functional efficiencies are re-validated, and at the other end environmental controls are reset. New group dynamics of intra-personal relationships also upgrade the productivity.

Learning and Improvisations are inevitable part of task handling. Tasks' spread, effort and time of accomplishment are continuously appraised requiring minor changes in the processes. By rationalizing task spreads one reduces dependence on handling tools and saves the physical energy of reach. Effort planning cuts the number of processes. Time management achieves faster delivery. Oft repeated task is always the most improvised one.

Social Factors operate at two levels: Group behaviour dynamics and the traditions or taboos, etc. Intra personal interactions, even if nonverbal, act as a relief in task handling. Socially siting and scheduling of tasks affects the group behaviour dynamics. The tasks and group behaviour are inseparable. Customs and taboos result from the local perceptions and experiences, and so same tasks could have different time and space setting (ethnic variations) across societies. These are more apparent in craft tasks.

13   AMENITIES AND FACILITIES

A space is a vast realm, however, it is marked by the limits of perception and so a finite entity. Such a space if can be occupied or possessed has a potential for habitation. The habitable space and the environment within are primarily configured by a system of barriers. The habitable space with Amenities and Facilities allows various tasks, but to endow a personal value, a sense of belonging a space requires enrichments.

Amenities are attached to a building shell. The linkage is for structural support through a wall, floor or roof, or for functional support for sourcing a 'supply or disposal utility'. One of the largest sections of amenities is for environmental control, such as projections, wind towers, air ducts, sun shades, pergolas, grills, etc. Some of the amenities are conceived to be architectonic elements for enhancing the architectural language.

Amenities could be both, structurally integrated solutions which are difficult to remove without damage to the building shell, and mounted entities that may perhaps be replaced but require an identical or matching solution for the sake of design integrity and fitment. Relocatable amenities are sometimes considered facilities. Amenities are also designed as a subsystem that is part of a larger system -the building. Such subsystem amenities have well-defined relationships or connectivity and so can be manipulated.

The structural elements of a building also serve the function of an amenity. An amenity nominally is static, but could also be a mobile, which then is called a utility. A static amenity can have some degree of internal variability like a louvre in a window, or an elevator in building. The static amenities are designed to take advantage of the location, orientation, connections, etc. Static amenities use their mass for their relevance and so are heavy. Static amenities do not consume power

and in most cases have no outputs except for disposal or extinction. Non static, dynamic or mobile amenities are difficult in terms of managing the inputs (power, etc.) and outputs (residues, effluents and disposal or extinction).

An amenity that relates to variations like a climate (Sun, Wind) is operational only for a part of the season, day or hour. Such amenities are also designed to be architectonic elements. Connections (power, water supply, entry) to fixed amenities, once set are difficult to re-establish elsewhere or everywhere. So one is forced to customise the living around the amenities or accept the inherent deficiencies.

Behaviour in habitable space often revolves around the amenities. Areas near the attached amenities attract all the activities. Due to these users seem to move from one amenity to another. All the intermediate space patches and time interludes become sections for secondary behaviour.

In buildings such attached amenities are platform for cooking, fireplaces, window ledges, door thresholds, otalas, steps, open to sky chowks, cutout, seats along the walls, etc. These are areas with very focussed behaviour, surrounded by a loosely defined zone but worthy of many 'free' activities.

Facilities are unattached entities within a habitable space, and so are demountable and relocatable. The word facility is used synonymously with an amenity. A space owner makes some rearrangements to all the facilities designed and sited by an expert. Such personal manipulations are intentional or experimental either of temporary or permanent nature. Changes in form and location of various amenities, is also occasional and seasonal. A space grows with age and reflects not only the taste but turmoils and compulsions of the user. The size, shape, locations of different facilities are as important as the Interrelationships. The siting of a facility in reference to the spatial quality and architectural ambience reflect the concerns for environmental conditions.

Facilities have ergonomic characteristics to enhance the human capabilities. A facility is conceived to satisfy the largest section of users via the 'percentile method', but leaving the most vulnerable lot of users, at the top and bottom, highly dissatisfied. This causes behavioural problems that are very acutely displayed in public expressions.

Largest section of facilities consists of various devices for carrying out tasks. These task devices support the body or its parts, facilitate and extend the reach, and aid the body movements and motions. Support devices provide a base for utilities like chopping and ironing boards. Posture taking devices like seating and resting devices are created with anthropometrics, but their styling affects the human behaviour. Storage systems are work organisers and do not affect the human behaviour.

Utilities are tools and equipments that are handy, though some require a base support for efficient working. Support dependent utilities are often nearly fixed devices. Sourced utilities are tied, require linkages for input-output like power or effluents. These are relocatable within a range. Hand-free utilities require very little manual manipulation for operations. Utilities become multipurpose because every variation in its support system gives it a new purpose. So it is, said creativity comes through the craftsperson or technician and not from the utilities. Majority of the utilities and facilities are preferential to right-handed people in terms controls and operations.

Enrichments are means of personalization of a space. Installation or removal of the enrichments does not affect the utilitarian value of a space. Enrichments do serve a decorative and metaphoric purpose. Enrichments are extremely personal and frequently replaceable, so are transient entities. Some functional entities like bolsters, cushions, dusters, etc. are items of comfort but are accepted as enrichments.

Enrichments are items of expression through their shape, form, scale, colour, texture, patterns, composition, symbolism, position or location, relationship with other objects.

The schema for enrichments originates through several sources like media, inter-personal interactions, print media, TV, cultural heritage, caste, religion, locale, region, pride, leisure time, motivation and competition. It is also supported by desire to add on the convenience offered over industrially produced standard goods, love for artistic intervention or crafty manipulation, experimentation, innovation, improvisation, upgrade, repairs, etc.

Enrichments are brought in by a person, members of the family or leaders and members of a group. The theme, as a result inevitably has one or singular 'authorship' and consistency of concept. This reflects in the unified effort. There is a continuous thread of concept, form, colour pallets, patterns, placement, symbolism, etc. Occasionally enrichments radically different also occur in such spaces, but over a period of time things gets accommodated. Even where a next generation inherits the space entity, their responses are nearly similar, and something of the past survives or is consciously continued. When a person or family migrate to new environments, the new place carries the imprints of the old, in many instances (for example NRI homes in USA) more intensely. Where space designing is outsourced to professionals a new vocabulary of enrichment arrives, but these too get domesticated or personalized. Such personalization occurs through re-siting, re-orientation, and new contextual composition. In few instances it may awaken new lifestyles, but something of the past always reappears.

Enrichments affect the behaviour very mildly but persistently. The cumulative change over a period of time is far greater in content and extent. The enrichments reflect the personalization, so are very comforting and assuring. It represents the author and an age, and reminds the contribution of the author or the era. Enrichments take away the loneliness and boredom. Enrichments add to the micro levels

of comfort without destroying the standard scheme of the space. Enrichments customise a space circumstantially, according to local environmental needs, personal choices and tasks. Enrichments are self created and installed so their repair, alterations and replacement are within the personal ambit of skills and time management. Enrichments are demountable and transferable, so remain personal assets. (For more on enrichment see chapter 14 Space Planning or click here).

14   SPACE PLANNING

Spaces need validation from time to time and on occasions. The validation by a user is continuous one, but as handled by a professional it is a contractual and periodical assignment. The change in space by a user, a lay person, relates to the rearrangements of the demountable and movable entities. However, a contractual assignment to a professional is far more encompassing, and may even reconfigure the space shell. Domestic space planning is self authored where as commercial spaces are rejuvenated by professionals.

NEED FOR SPACE PLANNING

Domestic spaces do not require frequent changes, often for the initial 15/20 years. Major changes are required when ownership changes. The space planning or arrangements become invalid also due to the user related circumstances, such as the changes in a family profile like age, physical abilities, marital status, professional interests, new intra-personal relationships and group dynamics, choices and social compatibility.

Commercial spaces see frequent changes both of the tenants and business styles. Space planning is also affected due to the user related causes such as: new concepts, aspirations, realizations, technology, variations in usage intensities, repairs and maintenance, optimum standards in society.

In all types of spaces space planning needs a recast when changes in building shell or structure alters the spatial quality. When few key elements of the space get a new look or functionality replacement and refurbishment, new space planning is required. Incorporation of new technologies (air conditioning, surveillance, security procedures, illumination, communication, information systems, storage systems) force new space planning. Space planning is hastened by major events like festivals, Olympics. Space planning reflects the access to expandable incomes available to person or national economy.

SPACE PLANNING DEVELOPMENTS

The space planning as a space efficiency method emerged in later part of the Industrial Revolution period (1800s). This was an age when number of gadgets for kitchens, toilets, craft areas, offices, industry, etc., began to be available. These initiated 'systems planning' thinking. The gadgets were conceived as fitments into a space, with planned connectivity and inter gadget relationships. Approach to 'comprehensive planning' later became 'Space Planning'. Women's hobby magazines of the time took it further, and helped in creating work efficiency layouts (home productivity) with behavioural considerations. For example, a window over a cooking range and sink were a result of these attitudes. At industrial level the line production layouts were carefully planned and regularly updated. The 'mega foot print' or extensive spaces of commercial offices required major re-haul of layouts when illumination and heating-cooling were electrified, telephony and better document storage systems became common. The new departmental stores of 1950s required very frequent space re-planning because of the fast changing brands and their packing formats.

At domestic level the house which had highly room specific spaces began to be open plan layouts with minimal of walls and partitions. It offered large unhindered space for various tasks. This was also due to smaller or one person family. The gadgets that were bulky requiring structural bearing were now multi tasking, miniatures, mobile or easily relocatable and affordable. This freed lot of space and need for compulsive siting.

It was now clear that anthropometric data or ergonomics was not the only consideration, but behaviour of the human beings was the key to space planning. The definition of spatial and occupancy requirements were important. Other thoughts related to flexibility of accommodating the future growth, access for the disabled, safety, security, etc. Homes, offices, industrial plants, jails, educational institutions, research facilities, wherever growth or rationalization was conceived, it was through space planning. Corporate organizations are replacing the layered system to team or department-based structures which favour classless, transparent or open layouts.

Early offices had, peripheral that is along the wall work tables and cabins. This gradually gave way to half height partitioned or 'compartmental office spaces'. But today, according to the International Facility Management Association, 68% of North American employees work in offices with an open floor plan or open seating. Open offices are space inefficient due to larger per employee area, but less clustered.

> Older employees and traditional businesses like, law, finance and other professionals, who have worked from cubicles, cabins and corner offices, find it difficult to adopt open offices. Open offices are blamed for affecting privacy, client relationships, employee productivity, loss of sense of belonging, and even compromising the morale.

Open offices provided a visual cohesiveness and spatial continuity. Open office-plan also incorporated the concept of compact personal work module -a work station. Computers had work stations as dedicated utility for multi tasking. Earlier craft's people like watch repairer, engravers, gold smith had such facilities, to reduce the movement.

> Offices during and immediately after world war-II period had as much 50 % of the total space devoted to storage. These were separated from work areas, and manned by store keepers. The store room volume and traffic to it were reduced with several technologies such as document facsimile systems, telecommunication, automated file access including the mechanical card-index sorting machines. Digital documents with computerization solved the problems of file storage, access and transfer. Now the offices were nearly fully 'human occupied spaces'.

> Wireless technology and cloud storage software make it easier for companies to embrace nomadic workstations, says Frank Rexach, a Shanghai-based vice president and general manager at Haworth.

> Rexach says 'People don't want to feel handcuffed to their desk, especially the Millennials' (= young people who were between the ages of 10 and 20 on September 11, 2001 defined as per Newsweek Magazine).

Laptop and tablet computers linked to remote servers reduced the location bound dependence. Wireless telecommunication, mobility and flexible work schedules allowed employees to work from location of their choice. The office space now remained a location for interaction. Of course this function too was met by video conferencing. Now the office space has become an unassigned seating place. The need to personally interact remained as acute, perhaps it

emerged more strongly. The meeting rooms are common or rented facilities. Its interior space has high efficiency ambience but does not match the corporate aspirations of a 'personal space'. In a different perspective, something similar is happening on educational campuses. The teacher-student relationship is missing on personal contacts. The lecture hall is partly replaced by seminar or workshop rooms.

> Open office culture is moving a step ahead. Now the desk is no longer your personal den. You come, take a spot that is free, connect and you are in office. It takes away the culture of sharing a chat or knowing who is on and who is off. The familiar faces are in the meeting zone, which too keeps on changing depending on availability.

Just like open office plans, many entities such as the partition less residences, self access retail outlets, libraries and kindergarten rooms have half or low height furniture elements. Glass curtain walled commercial buildings, etc. are also conceived to be boundless spaces. The boundless spaces are assumed to enhance the intra-personal interactions.

SPACE PLANNING BY PROFESSIONALS AND A LAY PERSON

New architectural entities when sold or rented to a client have many 'common or standard' provisions which need to be improvised for specific uses. Space planning is an adoptive exercise. Professional designers handle the project by developing a holistic strategy or an integrated approach. The space planning is very encompassing exercise requiring technical skills. Designers also have a selfish professional interest of impressing the client and the society at large with an invigorating solution.

A lay person may accept an initial standard design, and may not engage a professional for later day changes. A lay person, as a user, is continuously engaged with the space. Though the insight is greater insight, it is very subjective one. The user alters the arrangements as part of day to day living. There are a naturalness and continuity in the effort. It is often simplistic and devoid of the technicalities but very personal. The lay person primarily relies on

spatial rearrangement and micro adjustments of entities in space. Secondly, will buy ready-made items from the market, get it made, or craft them on own. Thirdly, the layperson exploits the enrichments for micro level space making and adds a personal flavour to the space.

PERSONALIZATION OF SPACES THROUGH ENRICHMENTS

Enrichments are personal interventions to a space, by professional designers as well as lay users. These are extras over the nominal functional provisions of space planning. For professionals such endeavours are to support the thematic concept. However, they often lack the conviction for the actual owner-user. For lay persons enrichments evolve with the space over a longer period and after several trials. Enrichments are a subjective involvement of the user, reflected in the selection and placement of the enrichment. The selection follows traditions, taboos, customs, instincts, experience, perceptions, daring, suggestions and compulsions. The enrichments become a matured style of the locality or a group, an ethnicity of an era or a geographical identity.

Enrichments are selected for their own quality or appeal, and also as fitments to a given situation, but often without contemplating the desired end result. These are attempts to alter the scale and complexity of a space, by an element that is personal and perhaps familiar. Enrichments, as a result reduces the alienation and loneliness, and reduce the incidence undesirable or severity of abnormal behaviours.

Personalization through enrichments occurs by many routes. The identification is achieved by cultural affinity, affirmation to a social cause (e.g. green spaces), confirmation to an ideology, expression of abstracted messages, display of authority, hierarchal structure, a diffusion, spiritual, history, continuity, desire for contrast or diversity, etc. Enrichments may not have a precise definition or explanation, but over a period attain an identity. Enrichments encourage the group dynamics with a sense of belonging. Enriched spaces have safety, security and assurance of performance.

Enrichments are:

Objects that can be savoured from many sides. Vessels, utensils, statues.

Surfaces like paintings, murals, wall pieces, posters, mirrors, glass, patterns, which denote floors, walls or ceilings or become partitions.

Furniture to aid postures, task supports, storage entities, space intervening objects, furnishings like carpets, bolsters and curtains.

Fittings and Fixtures that add to functionality of architectonic elements.

Signage and Graphics to convey messages, indicate layout, symbols.

Enrichments are extensively used by retail outlets that rely on brand selling, and corporates who thrive on image making. Automobile showrooms flourish with superfluous space enrichments, because by the time some mature integration occurs, a new set of entities arrive. Compared to this corporate offices and hospitality spaces have well-integrated schemes. Other public spaces like museums, law courts, halls, etc. use enrichments very judiciously disguising as graphics or signage. Religious and political functions and processions use enrichments to show their large following.

SPACE PLANNING BY VISUAL and NON VISUAL MEANS

The personalization of a space achieved through visual means is very obvious as much as it is effective. Non visual sensorial effects are difficult to perceive, so difficult to express, communicate or record. These are equally effective, but very subtle. Many of the visual means also provide non visual sensorial effects, at specific position and in certain circumstances. Professional designers, in their conventional space planning, give consideration to parameters like auditory, olfactory, tactile and atmospheric factors such as the temperature and moisture, etc. However, a lay person finds it very difficult to replicate these in a personal space. The judgements on these counts are speculative because effective results derive from cumulation of several factors. A lay person considers non visual sensorial effects at best as the reinforcing elements to

visual means. Other parameters such as the privacy, intimacy, well being, safety, security, seclusion and participation, are achieved through sensible space planning, but need space and time reinforcement through indicative means.

SPACE PLANNING and USE OF NON VISUAL SENSORIAL EFFECTS

Non visual sensorial effects are: mainly Auditory, Olfactory, Tactile and Gustatory.

> Auditory sense (relating to sound) provides the scale of distance, direction, and time. It indirectly reveals the quality of absorption and reflection.

> Tactile sense (relating to touch such as texture, temperature, moisture, electrical charge). It is a pervasive faculty, though some parts of the body are more sensitive. It is locative and part of the defensive mechanism.

> Olfactory sense (relating to smell or odours). It is closely related to quality of air and so instinct of survival is intimately linked. It is highly frontal and directional. It also gives the idea of distance.

> Gustatory sense (relating to taste buds) It is closely related to olfactory sense. It provides no sense of scale, distance or time unless with the Olfactory sense.

Visual and Auditory senses work in consonance, because both have a sense of scale and direction. In space planning one provides the clue about the other. The selection and placement of furniture, furnishings and enrichments can change the visual space perception, as much as the surface treatments of the same elements can change the audio quality. The purposes of space elements, their placement, composition, shape or size, are not very apparent to a casual visitor. However, such effects become apparent on the required occasion and

situation. Tactile sense requires one to be in proximity of the surface, yet the textures, nature of construction (hollow, foamed, micro undulations), etc. prompt the auditory response from a distance, and so preempt the perception. Odours are perceived with air and its movements. Enclosed rooms filter the noise but reduce the chances of fresh air. This portends into 'smelly' or stagnant space. A designer has to perceive a space planning layout with all these overlapping sensorial effects, and also notions people have.

Noise: The size of work modules in open offices for the individual is decreasing due to factors like lesser personal volume of storage, smaller work area (instead of ledgers and files, it is laptop or notebook), and common facilities for interactions. There is a proportional increase in population density. The employees cannot stay focussed with greater noise levels, higher office population density and distractions from moving people, monitors and telephones. A mixed patterned space offers variety of spots, both uninterrupted and busy, private and collaborative, quite and participatory, to resolving the tension, loneliness, privacy, etc.

> Sound masking is in contrast to the technique of active noise control through volume and pitch. It is addition of natural or artificial sound, such as 'white noise or pink noise' into an environment to cover up unwanted sound by using auditory means. It nullifies the awareness of pre-existing sounds. Open offices are either too quiet (such as past midnight, where someone dropping a pen in the next cubicle is distracting due to absence of background noise such as traffic), or too noisy (such as when the conversations of others in the office make it impossible to concentrate). Sound masking is adding of sound to cover the existing sounds in the area, to make workers less distracted and more productive. Private offices and study rooms are not sound proof as sound can travel out through partitions or over the walls Sound masking can be provided in adjacent private offices, or in hallways outside of private offices, to ensure that confidential conversations remain confidential. Public spaces are used to reduce the continuous disturbance from road or railway traffic in covered walkways, under passes, deep and extensive parking areas, etc.

Atmospheric parameters: HVAC and other experts take care of these aspects of atmospheric comforts in space planning. The air movement in large spaces have few problems, for example, in humid climates. Very high air movements disturbed paper and ruffle the hair. Yet there always are few pockets with poor air circulation. Such pockets are more prominent in open office plans which are partly compartmentalized. Open office-plan can be well sustained with a

machine aided cooling or heating systems. The floor touching partitions of open office cubicles and comparatively low ceilings hinder air circulation. It creates areas with poor air change, uneven cooling-heating, poor moisture control, inadequate dilution of air bourne pollutants and odours. Presence of mosquitoes in the lower sections of cubicles due to stagnancy of air is a great health hazard.

Odour control: Odours occur and persist in commercial spaces. Odours are generated by materials, processes and human occupation. Confined spaces such as underground car parks or basements, garbage areas, passages, etc. have poor air-change. Offices where coffee, snack and meals are allowed in work zones have greater degree of air fouling. The odour can be controlled through basic three methods: Greater dilution with fresh air, Finer scrubbing of odours, and Larger exposure to natural sun-light UV rays. Odours from surface finishes, cleaning compounds, treatments applied on furnishings and degeneration of plastics, etc. are controlled best by proper selection rather then any processes. Human skin scales, biologically degenerate very fast, and it is a major problem for spaces with large human traffic. Here again regular vacuum cleaning is the best method, but for this smooth and hard floors, in place of fiber or synthetic carpets are required. Odours of slightest measure are detested by first time visitors. However, masking an odour with deodorant is only delaying the effects of odours.

For good ventilation dilution, adding fresh air, is the best technology. Next method is to use various types of non chemical techniques of scrubbing the air (ion charging, micro filtering, etc.). Ventilation system adjusts the temperature, replenishes proportion of oxygen, removal or addition of moisture, diluting or scrubbing the air to remove odours, smoke, dust and airborne bacteria.

SPACE PLANNING AND BEHAVIOUR

Space planning determines the placement of various items of furniture. The placement decisions follow two important strategies:

1   Functional positioning and circulation integrating various architectural features.

2   Provisioning for personal spaces and for Inter-personal relationships or group dynamics.

It is this later aspect that can destroy all the good intentions of the former. Space planning and behaviour as political etiquette is a time-tested mannerism formalised in government protocol manuals. It shows how two equal or unequal status heads of state or such entourages must meet. It indicates the nature of seats, intervening pieces of furniture, the backdrop for the meet, and enrichments that are appropriate, and ones that must be avoided.

> The chairs for personal meeting of two important (equal status) personalities (e.g. Presidents of two nations) are upright single seat units (placed parallel but very slightly askew @140°). But we still find dignitaries taking on micro postures by moving towards or leaning on one handrest, sitting cross way (diagonally), leaning forward or backward. The reasons are: one is trying to enlarge or reduce the distance, take postures that imply affability, propriety, esteem, etc. However, the sitting arrangement between two unequals, like a president and a prime minister (or a prime minister and a foreign minister) have two unequal (size, form, style) types of seats. The person with higher status sits in a single seat unit, whereas the other party is made to sit at a right angle, and on a wider seat (double or triple seat sofa or even stiffer - upright seat). The furniture arrangement, the angle and the distance between them are regulated by set of rules or 'protocol'. In spite of the strict protocols people through micro posturing do subconsciously express their real attitude. The body language is just one facet of behaviour that reveals the nature of the encounter.

At domestic level traditions and taboos are followed for placing the items of furniture. Commercial spaces and hospitality spaces reflect a mix of local mentality, good practices, and new trends elsewhere. Traditions emerge after years of usage and portray the geographical, historical, cultural, religious and technological preferences. The trends show universal preferences emerging from cross reactions of many art forms. The furniture and its placement offer several postural and interaction possibilities, affecting the personal relationship as well as group behaviour dynamics.

> Living rooms of economic housing schemes are 3000-4000 mm wide. The eye contact or person to person distance for such sofas across the room is 2400-3400 mm, just

adequate for social or non intimate chat. However, for a living room width of 5000 mm, the interaction distance becomes (for sofa across the room) 4400 mm. This is not conducive to social interaction, unless one can makes own-self herd by talking loudly, or seating forward -at the edge of the sofa. In large rooms chatting is more common with persons sitting on the side seat.

Intimacy and privacy

These are important aspects of space planning in hospitality spaces and personal cabins. Visitors need these in appropriate mix, but staff also needs to maintain a non intimate posture and distance.

In such places receptionists are always in standing position -as if ready to serve. The backdrop is nearly 1500-2000mm away -meaning they are on their own, confident, and cannot depend on back support. Coffee house and pub tables are small, so that people sitting across maintain intimate distance of 600 mm or less. Banquet tables are 1200 mm to allow talking across the table, but a wider table 1500 mm or more discourages the personal interactions and makes the occasion more formal. Important personalities use office tables of 900 mm or more depth to create a person to person (face to face or eye contact) distance of 1600 mm, which makes the interaction formal and noncommital.

For more on Intimacy and Privacy see chapter 11 or click here .

Recognition:

Recognition of personal attributes in a space planning layout automatically resolves many issues of intra-personal relationships. Every individual needs to play a role, wether it a small domestic, or a public space, but in a required setting. The set is made of architectonic elements, space occupying entities and environmental conditions. Recognition is also important for expression and communication. The deficiencies of personality are made up by the surroundings. Some of the tricks, people consciously or otherwise use to draw recognition are: Standing against a wall but little away from it, occupying a single seat rather then share one, positioning against a bland-background then a clustered or busy face, sitting in a tall, upright and an uncomfortable chair opposed to an easy and low height seat.

Security:

A person feels secure if protected from at least one side and can control the distance for group behaviour dynamics. A person must get the benefit of natural attributes of the personality such as age, sex and social stature. A person may not feel confident and so secure if under a continuous gaze or surveillance. Feeling of security is more enhanced in known spaces or spaces with a familiar set-up. Large spaces with adequate points of anchors or interventions make a person feel secure. People feel secure with exits points like a door, stairs, passages, aisles near them. A view of outside from an opening adds to security. Presence of handling, holding or barricading devices adds to security, even if one may not intention or need for using it.

Ownership or Sense of Belonging:

The control mainly derives from the right to conceive, execute, alter, explore and exploit a space. For this one may not legally own or be a tenant of the space. Members of a family or a group get a sense of belonging. People with same ethnicity or cultural orientation feel 'at-home' in spaces that have a familiar set-up. Spaces with standard internal features provide the equality. Similarly a sense of belonging may occur where external configurations are similar, as in public housing schemes.

15   REAL AND VIRTUALLY REAL

Habitable spaces are substantially real and physical, but could also have features that transcend the reality. Such conditions occur because the human cognition sometimes functions ambiguously. The subconscious human behaviour expresses itself free from the rationality, restrictive customs and structural limitations.

The ambiguities in cognitive processes arise as the Time and Space gets mixed up to produce incoherent and surprising effects. The elements nominally distanced in time or space are 'virtually' juxtaposed in a make-believe world.

Time is seen as a measure of change, and Space is perceived for its consistency (or even lack of it) over a time. The percepts in time and space like the primitive man, watching a star and noting its almost intangible movement in sky, or watching own-self becoming old, must be comprehended only in mind. To note the difference, two such distinct frames must be juxtaposed. This was done through expression (of behaviour) for wider confirmation. When the dream and reality transcend there is sense of 'Avidya' (lack of knowledge), a Maya as the cause of illusion.

> Thinkers, such as Aristotle, Plato, Frege, Wittgenstein, and Russell, have made a distinction between thought corresponding to reality, coherent abstractions (thoughts of things that is imaginable but not real), and that which cannot even be rationally thought.

Reality is the state of things as they actually exist, rather than as they may appear or might be imagined. Reality is often contrasted with what is imaginary and delusional. The reality and the dream find expression in dominantly a visual realm. All art and magic except the alchemy are visual. A computer mediated, reality, till now has been of visual perception.

To resolve the contradictory conditions of reality and dream, people have created 'unnerving and illogical scenes', strange creatures, grotesque forms,

and queer built-spaces. These have been methods to expose the psychological truth by stripping ordinary objects of their normal significance. The disdain for literal meanings given to objects is considerable. It forces a compelling image, beyond the ordinary formal organization, and has evoked the empathy of the viewer.

However, between the real and virtually real there has always been something extra, the superfluous. The superfluous, is the applique decoration, carrying its own meaning. It is essentially intended to counter the mundane. Sir John Summerson, the architectural historian calls it 'surface modulation'. He also says 'Architecture had, with some difficulty, liberated itself from the ornament, but it has not liberated itself from the fear of ornament'.

The shrouded symbolism of decorations and the contempt for the explainable interpretation, led to creation of new space making elements. The first attempts were like photograph processing tools of superimposition, merging, morphing, fading, etc. It created visual aberration for not just for the depth in space, but a deviation of objects in a time frame, a 4D effect. Films and television provided the impetus to make-believe cognition, beyond the visual frames.

> Salvador Dali's painting called 'Persistence of Memory', with melting images of pocket watches was in rejection that time is rigid or deterministic. It suggested the theory of Einstein's that the time is relative, and not fixed. Dali works incorporated optical illusions, negative space, visual puns, and trompe l'oeil visual effects, stereoscopic images. He was among the first artists to employ holography in an artistic manner. Dali had a glass floor installed in a room near his studio. He made extensive use of it to study foreshortening, both from above and from below, incorporating dramatic perspectives of figures and objects into his paintings. Dali's post–World War II period bore the hallmarks of technical virtuosity and an intensifying interest in optical effects, science, and religion. Dall sought to synthesize Christian iconography with images of material disintegration inspired by nuclear physics.

Experiments to involve time in built forms helped the emergence of several forms and techniques for manipulation of the reality. Both impinge on each other in various measures.

1	Ornamentation had too much metaphorical connection with the past, and very static visual impact, both restricting the time dynamism. For the process of de-ornamentation, geometry, functional, structural, and spatial aspects provided the much needed excuses. The concepts that became the tenets of modernism for architecture and products, etc. were, 'form follows function, purity of form and truth to materials'. However, abstracted arts and crafts had no 'functionality or the truthfulness of materials to rely on, and the confusion continued through the cubism, surrealism and Dadaism, etc.

2	Deconstructionists attempted to move away from such constricting aspects. They compromised the geometry of form by abrogating the functional, structural, and spatial aspects of construction, in the architecture, literature or stage arts. But in architecture they still had to deliver a building standing with the gravity and other forces, and in literature and other arts it had to be a deliverable product or a recognisable entity.

> Dali was not alone in trying to project the persistence of time. Many others have followed the path but differently, characterized by fragmentation, an interest in manipulating a structure's surface or skin, non-rectilinear shapes which appear to distort and dislocate elements of architecture, such as structure and envelope.

> 'Peter Eisenman's Wexner Centre for the Arts: Some of the grid's columns intentionally don't reach the ground, hovering over stairways creating a sense of neurotic unease and contradicting the structural purpose of the column'.

3	The movements in architecture and products had one major problem, one had to 'conceive, plan and detail' the entity, to execute it. For developing complex forms, the age old means of orthographic drawings, model making and perspective like visualizations were now too insignificant tools. It had to wait the arrival of the computer to 'conceive-plan-detail and visualize' the complex forms. It also now endowed that 'not everything that looks odd is deconstructionism'.

THE MAKE BELIEVE

It is observed that under stress, physiological capacities fail for indeterminable reasons, or can perform extra ordinary feats. The cognitive capacities

combined with specific reach tools, aid of mental processes and hallucinogenic drugs sense extra ordinary situations. Here the unreality is due to the 'ethereal spread of the space and dispersion of time'. These are uncommon things that can occur without any premonition. An individual instinctively looks for the triggers that caused the make-believe effect whereas a group will need explanation and confirmation.

Seeing an image of own-self in the still water or over a glossy surface, where left and right also get reversed, must have been such a situation for the primitive man. The magical impact of a powerful representation in painting, a captivating form of sculpture, a transparent glass bead or stone crystals, a shadow or black colour hiding a detail, all were such make-believe situations. It was a new reality. These are replicated and soon the repertoire of make-believe becomes a nominally confirmed technology.

Make-believe situations have been powerful-conditioner of human behaviour just not through the novelty but its sheer efficiency on time and space scale. With frugal spread and quicker delivery such virtual situations are the most productive tools.

Make-believe represents an experience created without the full support of the original conditions, such as environment, space configuration, materials or psychological make-up of the observer. Once the familiarity through over exposure increases it may not be called make-believe.

Virtual reality (VR) manifested by chance, or it was intentionally devised for life like reality. Historically VR applications in arts, crafts and architecture, have been of visual experience. It is now found in graphical displays on a computer screen or through special stereoscopic systems. Such conditions, often including the audio effects are available in holography, HD, and 3D. Advanced, haptic systems using tactile information, generally known as force feedback are emerging in fields like medical and gaming applications.

Artificial Reality (AR) is considered as something that is indistinguishable from reality. It is so because the means are subtle or process is obvious.

Simulated reality manifests through the means or tools of simulation. The tools created an environment of limited spread and duration, within which setting an adjusted realm is evident. One may or may not be fully aware that they are living inside a simulation.

Augmented reality (AR) is a physical and real-world environment whose some of the components are added upon by other input of sensorial nature to enhance their effects. These could be additional information like charts, maps, enlargements, compressions, alternative views, colour filtering or masking. All these are mainly visual effects. AR is also called a mediated reality. Augmented reality could have other sensorial effects, such as enhanced haptic reality (touch related). It is used for vibrating alert in a cell phone, blood pressure measuring instruments to sense the blood flow through a vein and also the pulse rate, in remote sales outlets to let a customer get the feel of material or product.

Some of the Virtual artifacts include: Toilet seats, treadmills, gaming devices like mouse, wired gloves, artificial limbs, spectacles, hearing devices, simulators for training, air port landing systems, synthetic cornea, robots and robotic pets, remote surgical tools and drones. Intelligent homes (such as one by Bill Gates) include such artifacts.

VIRTUAL WORLD OF SOCIAL COMMUNITIES

Non geographic communities on Internet like Face book, Tweeter, Orkut, etc., are examples of virtual societies. The interpersonal relationships that occur here are not in a physical space or environment, and the participant at the prime end is a human being but at the other end could also be 'unreal' like a robotic computer.

Virtual reality can operate directly with the brain bypassing the sensorial nodes and functions. A 'person to brain' interface helps in executing the tasks

by getting around the conscious blocks, such as the phobias, fear of public speaking, inhibitions, and vagaries of awareness and consciousness. A step further would be community based on brain-computer connection. The computer perceives, responds and moulds the interactions between 'brains' of the members. The participant may be induced by any number of possible means to forget, temporarily or otherwise, that they are inside a virtual realm.

Migrants, people displaced due to war and natural disasters, need to be 'in touch with each other', virtual technologies can allow them to seamlessly see, hear, and touch each other, as well as share real objects and equipment.

Behaviour interpreters that can perceive expression, through speech, use of language structures, facial gestures, micro changes in postures, blood pressure, muscle and joint movements, will be a step beyond the current state of telephony.

Virtual reality is distinguished from the experience of actuality but a simulated reality makes it difficult to perceive the reality. Matrix series of movies try to mix virtual and simulated reality.