

Rejuvenating Dysfunctional Public Spaces Using Augmented Reality Systems (ARS)

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Abstract

This paper aims to discuss the reasons as to why public spaces in urban areas become dysfunctional, and focuses on a specific public space in the historic city of Kandy, Sri Lanka. The main objective of the paper is to provide a solution for dysfunctional public spaces by rejuvenating them with the use of Augmented Reality Systems (ARS). The study explores how digital interventions in urban public spaces can be used without impairment to the historic relevance, social integrity or urban fabric of a location.

Keywords

Augmented Reality, Urban space, Public Space, Architecture

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1. Introduction

Terms such as Placelessness (Relph, 1976) Lost space (Transik, 1986) Negative space (Transik, 1986), Non-place (Webber, 1964), refer to dysfunctional space which is discussed within the context of the theme of this paper. Aims of redesigning dysfunctional spaces lie with the attempt of using city wide connections, using contextual properties, and using existing pattern of an urban space as tools for restructuring urban coherence and guiding new development in desired directions.

Conceptually all public spaces are designed, bearing the imprint of public intervention in the creation of the boundaries that define the spaces (Chua et al., 1992). In this context it is pertinent to examine the causative factors which lead to the dysfunction of public spaces with specific design intent. Economic as well as social implications within the urban context make redesigning of dysfunctional public spaces doubly important.

The study attempts to identify the reasons as to why a specific public space located in Kandy, a historically

significant and culturally rich city in Sri Lanka, has become dysfunctional and tries to present a regenerative solution through the use of Augmented Reality Systems.

1.1. Kandy: An Introduction to the City

The city of Kandy lies at an altitude of 488.6 meters (1626 ft.) above the sea level in the centre of the island of Sri Lanka. Being the last stronghold of the Sinhalese kings of the late mediaeval times of Sri Lankan history, the city has gone through many vicissitudes, intrigue and turmoil, complicating its history. But true to its past glory, Kandy still remains the principle cultural city of Sri Lanka.

Even though nearly 40 prehistoric sites are found within a 5 to 30 km range of Kandy, and some distance away, sites associated with the proto-historic iron age culture from the first millennium BC are found, and even evidence of Buddhist monasteries belonging to the 3rd or 2nd century BC have been unearthed within its immediate vicinity, the city first comes into historic view as an urban center during the 13-19th century, then known as *Senkadagalpura*- The city of *Senkadagala*. Under King Vickramabahu, the founder of the Kandyan dynasty, Kandy becomes the capital of a regional

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kingdom in the 15th century. Even though other parts of the country fall into the hands of invading armies, Portuguese and Dutch fail to capture Kandy, and from the 17th century

Kandy becomes the principal political center of Sri Lanka until the city succumb to the British through agreement of the Singhalese elite in 1818. (Bandaranayake, 1997)



Fig. 1. Context if the site.

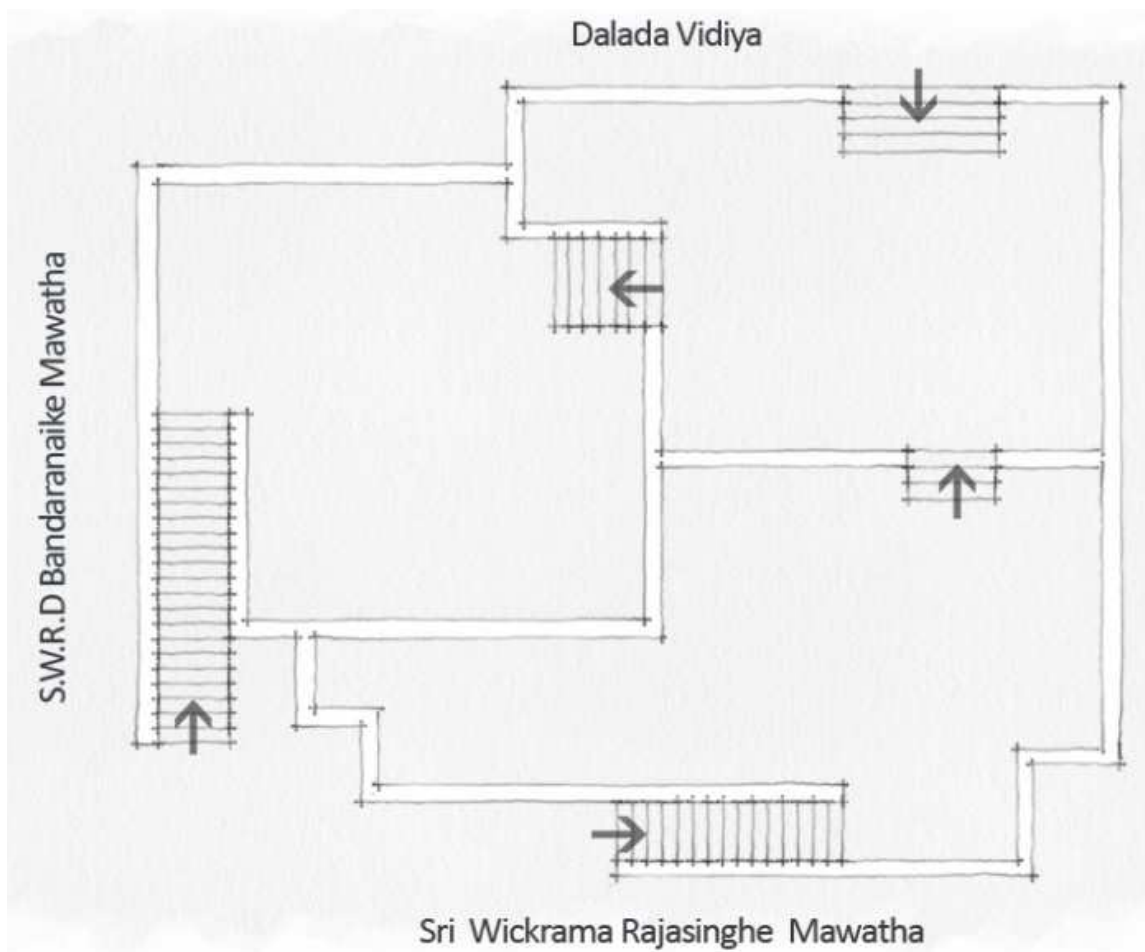


Fig. 2. Layout.

The city's historic physical fabric is a blend of the two distinct discourses of kingship, which Duncan (Duncan, J. S, 2005) mentions as Asokian and Sakran. Asokian discourse favors the production of a landscape dominated by religious structures and public works for the benefit of the people while the Sakran results in a landscape of palaces and cities modeled upon that of the king of gods in heaven. Influences by foreign invaders added to the built fabric the colonial essence which is evident in most of the buildings which are seen at the city center.

The British destroyed the territorial self of the last Lankan kingdom of Kandy, eliminating all significant traces of indigenous political power and cultural identity (Perera, 1997) leaving remnants of colonialism adorning the streets of Kandy, blending with the traditional cultural idioms of Sri Lankan Architecture. New additions to the city have been rapidly transforming its character and the spirit, governed by a loose set of urban design guidelines and regulations. In the heart of the city lies a deserted public space created in the mid-eighties to facilitate social interaction which presently facilitates nothing but emptiness.

1.2. The Site: George. E. De Silva Park

George. E. De Silva Park is located at the heart of the Kandy city, bounded by Sri Wickrama Rajasinghe Mawatha, S.W.R.D Bandaranayaike Mawatha and Dalada Vidiya. It's located on top of the roof of George. E. De Silva shopping complex, which houses small boutiques that sell items such as clothes and ornaments. The park is accessible through a series of steps.

2. Why Do Places Become Dysfunctional

The reasons for dysfunctional places can be identified under three broad topics- Globalization, Mass Culture and Outsideness which will be later scrutinized in detailed subtopics pertaining to the public space at Kandy.

2.1. Globalization

Globalization built on the foundations of violence and politics (Lentner, 2004) has been defined as the growing interdependence of countries resulting from the integration of trade, finance people and ideas in one global marketplace (Maha et al., 2008). In the contemporary world very powerful pressures exert themselves against traditional societal bonds, and individuals are left isolated reliant on their own devices to succeed in both private and public spheres (Bauman 2001). Dysfunctional environments which lack the diversity and richness of place experience and meaning have been

encouraged by the impact of capitalist globalization and modern technology (Huang, 1995) and have influenced the commodification and the devaluation of places (Mahyar, 1999). Globalization and its impacts have brought upon changes to traditional spatial forms and processes creating alien entities which not only disrupts the cohesive structure of the city but resulting in creating desolate and dysfunctional spaces. This process of transformation has brought about changes in the meaning, identity and character of urban public spaces while dominating historically constructed space of places. Globalization in general weakens local ties and fosters homogeneity and sameness based on the tenets of consumerism and capital mobility (Mahyar, 1999).

2.2. Mass Culture

Globalization has brought upon the mass culture from which emerges the process of mass production, mass marketing and mass consumption that standardizes culture and places destroying local indigenous cultures. For Nietzsche, the state and mass culture were bitter rivals against genuine culture and he saw both the modern state and mass society as producing mediocrity and cultural backwardness, as well as generating mass hysteria such as nationalism and anti-Semitism (Kellner, 1999)

Crang mentions that issues on placelessness can be interpreted as fear that local supposedly "authentic" forms of culture made from and making local distinctiveness are being displaced by mass produced commercial forms imposed on the locality (Crang, 1998). Private corporate symbols are increasingly intruding on public spaces controlling its character and the activity labeling functions and presenting a false sense of place, privatizing not only spaces and places but services as well. These are the products of government agencies, private companies, and global enterprises created through professional designers which do not relate to the people. Relph mentions that mass identities are assigned by opinion makers provided readymade for the people disseminated through mass media and especially by advertising (Relph, 1976).

2.3. Outsideness

The essence of place lies in the experience of "inside" that is distinct from an "outside" which is what essentially separates space from place and defines physical features activities and meanings (Relph, 1976). This sense of belongingness or the insideness generates the sense of territoriality, identity and the need to control. Relph mentions that from outside you look upon a place as a traveler might look upon a town from a distance from inside you experience a place (Relph, 1976).

Shultz mentions that to be inside is the primary intention behind the place concept (Norberg-Schulz, 1971). Places are critical to human experience because they are centers of existence and contribute to our sense of identity (Relph, 1976). Relph further presents three types of outsidership, Existential outsidership- alienation from people and places, Objective outsidership- deliberate adoption of dispassionate attitude, Incidental outsidership- places experienced as background and four types of insidership, Vicarious insidership- secondhand experience without visiting in place, Behavioural insidership- sight most important element of experience, Empathetic insidership- openness and respect to place, Existential insidership- deep and complete identity with place.

3. Dysfunctionality and Human- Environment Interaction

Many schools of thought have been directed towards more integrated approaches in providing solutions to the problems of urban space. Transik mentions three approaches to urban design theory, on the basis of research in to the evolution of modern space and the analysis of historic precedents, figure-ground theory, linkage theory and place theory. Even though these theories carry significant differences, as a whole they present strategies for integrated urban design (Trancik, 1986). Whilst the first two deals with more of the physical component of the city, place theory relates to the behavioral aspect of people.

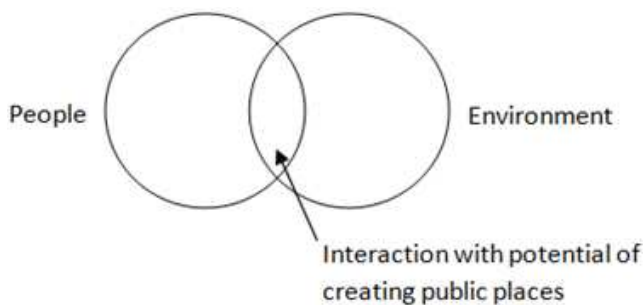


Fig. 3. Interaction between people and environment.

The dysfunctionality of public space in Kandy might have occurred due to various reasons. According to Transik's theories, one reason might be that physically the space might have not been properly linked with the rest of the city. Transik quotes Fumihiko Maki and states that "*linkage is simply the glue of the city. It is the act by which we unite all the layers of activity and resulting physical form of the city*", he further quotes maki in saying that linkages can either be implied, physically imposed or naturally evolved. In figure

ground theory he elaborates on the need of understanding of urban form as the analysis of relationships between building mass and open space. The spatial relationship with the rest of the city can be analyzed using this theoretical basis. According to Transik, the essence of place theory in spatial design lies in understanding the cultural and human characteristics of physical space.

Relph (Relph, 1976) states how the sense of belonging to the environment affords the environment in becoming a place. He quotes lukermann where six major components of space are given,

1. The idea of location
2. Place involves an integration of elements of nature and culture
3. Place is unique yet interconnected
4. Places are localized: they are parts of larger areas
5. Places are emerging or becoming: with historical and cultural change new elements are added and old elements disappear
6. Places have meaning

Deriving from these components, Relph states that place is not just the "where" of something: it's the location plus everything that occupies that location seen as an integrated and meaningful phenomenon. (Relph, 1976)

In agreement with lukermans components, Gieryn states that the places we build appear as clones of places elsewhere: suburban tracts, shopping malls, freeway interchanges, office complexes, and gussied up old neighborhoods vary less and less. As places lose their distinctiveness, place loses its reality and significance (Gieryn, 2000). The monotony of urban tapestries have lost the grandeur that they once had. The places within cities have become repetitive, and meaningless. In this context it is pertinent to question whether we are creating public places or merely public spaces.

3.1. Meaning in Place

The meaning of a place plays a pivotal part in understanding the essence of a place in terms of how it fits in to the physical fabric as well as how people perceive it. The meaning of places maybe rooted in the physical setting and objects and activities but they are not property of them rather they are a property of human intentions and experiences (Relph, 1976). Lynch mentions that the environmental image may be analyzed into three components, identity, structure and meaning. He further states that, meaning is relational but quite different from spatial or pattern relation.

Creswell establishes three approaches to place, a descriptive

approach-which discusses the distinctiveness and particularity of place, social constructionist approach-discusses the underlying social processes of place and a phenomenological approach- which seeks to define essence of human existence as one that is necessarily and importantly “in place” (Cresswell, 2004)

In a phenomenological approach to place, Rappoport mentions that the term “meaning” is too global and typifies into three categories, high-level meaning-which is related to the cosmological and philosophical systems, middle-level meanings which communicate identity, status and power and low-level meanings-which are mnemonic cues for identifying uses for which settings are intended and hence social situations, expected behavior and the like. (Rappoport, 1990)

Deriving from these definitions, meaning of place can be described as having personal, communal/social, and universal attributes (Silva K. D, 2009). For example if we take the city of Kandy, the universal attribute would be the historic significance of the city, the social attribute would be the cultural or religious significance of the city. The universal attribute would be easily understood by a visitor to the country. They would relate other historic cities of the world and try to compare it with their own personal experiences. If we take a person living in Sri Lanka, the cultural meaning he attributes with the city might not be completely grasped by a visitor to the country. If we take two people living in Sri Lanka, one living in Colombo and the other living in Kandy, the personal meaning that each of them attribute will be different owing to the personal relationships that they have had with the city. So the most complicated attribute would be the personal meaning. Places are not essences but process they don't necessarily mean the same to everyone. (Massey, 1995)

The questions that arise here are how can public places accommodate these factors? Is it possible to attribute public spaces with personal meaning? If so then does that imply that public spaces also become personal spaces? In a culturally significant context such as Kandy the meaning of the place should undoubtedly accommodate its sociological and cultural significance. The existing public space does not seem to be embodying any of the characteristics discussed herein. In the midst of a historically significant city it presents itself as a modernized plaza alienated from the Sri Lankan cultural values of public space. In this context it would be relevant to observe Sri Lankan traditional public spaces and their essences in an attempt to accommodate these qualities within a modern re-representation of such a public space.

The traditional Sri Lankan concept of place is related with the phrase, “*gamai dagabai, wewai pansalai*” which translates as village and stupa (dagabo), tank (reservoir) and

temple. The emphasis on the vernacular aspect should be taken note of. In a secular sense, traditionally public activity took place in the *Pola* (traditional market place) and in the paddy fields. Public spaces created in strong cultural contexts should afford to relate to this cultural base. Meanings should be derived through this base, and be applied so that it relates with the rest of the city, culturally and socially linking with city. However meanings should not be simply replicated or imitated from tradition, as in the case of the new shopping mall created in Kandy, which in physical form attempts to compete with the octagonal form of the “Temple of the Tooth Relic” which is the focal point of Kandy. The formation of new public spaces such as malls question the need of open public spaces such as the one in discussion. The proposition that these malls are nothing but a simple mimicry of their western counterparts which began their downfall in the nineties (Shaer, 2009) questions the validity of promoting these types of public spaces. It is also questionable whether malls can be considered as public spaces at all (Shields, 1990). Mitchell interprets malls as pseudo public spaces (Mitchell, 1995)

The interwoven relationship between meaning and identity is returning to the concept of place that Lynch proposes as the environmental image which is presented through three aspects, identity, structure and meaning (Lynch, 1960). Lynch states that imageability or legibility is the quality in a physical object which gives it a high probability of evoking a strong image in any given observer. Lynch provides a framework to improve imageability through paths, nodes, districts, landmarks and edges. Using this framework it would be prudent to attempt deriving a methodology in enhancing the physical attributes of the public space in question.

3.2. Privacy, Territoriality and Control in Place

Privacy in public spaces works both positively as well as negatively. In a positive aspect it generates enclaves for closely knit groups of people to gather and maintain their distance from the rest of the community; similarly this promotes segregation within the public space. Public spaces are also places of voyeurism, it is a place to watch and be watched. Private enclaves enable individuals to dictate their behavior upon the environment without the environment manipulating them. Privacy within public space enables in creating personal spaces within public space. Relph refers to personal space as special locations and settings which serve to recall particular personal experiences through the setting itself (Relph, 1976). He quotes Rene Dubos who states, “*I remember the mood of places better than their precise features because places evoke for me life situations rather than geographical sites*”. This personal space refers back to

the personal meaning of public space. Childs (Childs, 2004) elaborates on Edward Hall's classification of public spaces according to their size based on his observations of the social meanings of proximity and how close together a space requires people to be. Hall presents three types of public spaces- Coves which are the smallest with small front yards, narrow sidewalks, and small seating nooks, Rooms which he describes as social court yards which allows people to be far enough apart but is enough for people to read facial expression, and Grounds which are places which are intended for large groups.

Public territories are identified as areas where a person has freedom of access, but not necessarily of action. (Lyman et al., 1967) In so called civilized conditions, proximate demands like those of identity, privacy and security seem to dominate the causal spectrum of behavioral territoriality (Malmberg, 1984). If public space is considered as a public territory, establishing private territories within that public territory leads to conflicts. Lyman et al, points out in example that certain people might be restricted access to public spaces by the people, creating public territories, such as in the case of how people perceive homeless people within public space (Lyman et al., 1967). Desmond Morris comments on creating territories within public space as well. People demarcate their territories using simple objects such as towels or umbrellas on a crowded beach. (Morris, 1979)

Territorial behavior can be considered a mode of controlling place. which raises the question of who controls what or who controls who? Who decides who should control a public space? Is a controlled space, public at all? The territorial behaviors of screening certain communities is a control methodology, it is an example of the public controlling the public. The need of removing the homeless from visibility in public spaces is one of the fundamental issues encountered by public spaces. Although homeless people are nearly always in public, they are rarely counted as part of the public. Homeless people are in a double bind. For them, socially legitimated private space does not exist, and they are denied access to public space and public activity by capitalist society which is anchored in private property and privacy (Mitchell, 1995). The design of benches in public space are changing dramatically in order to become anti-homeless. In Japan, a new movement by the government is allegedly promoting anti-homeless art, depicting monuments which are placed on uniform surfaces in order to prevent people from sleeping.

Control also leads to the aspect of surveillance which in turn generates issues of privacy. Public spaces are increasingly falling under the gaze of video surveillance. In the guise of maintaining law and order, public places are losing their most valuable asset, freedom. Guirguis States that public places

are areas to which "access is not meaningfully restricted," and is "visible to the public," as well as "accessible to the public." (Guirguis M, 2004). in a legal vantage point he states that the Supreme Court in USA has repeatedly held that people do not have reasonable expectations of privacy against government intrusion in physical characteristics, (legal or illegal) activities, and objects that are exposed to the public because "the police cannot reasonably be expected to avert their eyes from evidence of criminal activity that could have been observed by any member of the public." The question that should be posed is, how does surveillance affect public space? As government owned public spaces increasingly fall under the watchful eye of the law, people shift towards a different form of public space, a public space owned by private cooperation: the mall. However, allowing access to only the selected (Shields, 1990) using high tech surveillance and even their own private security forces, malls are exactly the opposite of what is perceived as public space.

Deriving from the above, the exemplary public space should offer the exact amount of privacy so as not to promote the forming of territories and provide the user with the control over the environment. The user should have complete autonomy in being able to manipulate the place according to their needs, and create an environment which not only caters to the individual but to a larger community.

3.3. Consumption and Commodification of Place

Sennett states that public space as a secular space within the modern city has always been a hybrid of politics and commerce (Sennett, R. 1992). Public spaces have become the surrogates of consumption, to the extent that their existence has come to depend upon the commercial aspects. Controlled pseudo public space such as the mall, thrives on the premise of consumerism.

The relationship between public space and economy works reciprocally. In the same way that a successful urban space relies on the consumption, the economy benefits from urban space, in example by increasing the property values in its vicinity, as well as increasing rates of business ownership and community economic development (Childs, 2004).

Case comments on white washing public spaces through entertainment and the creation of an image of community based on corporate control which he calls "Disneyfication" and attributes this to the impact thrust upon society by the Walt Disney cooperation in the creation of Disneyland (Case. T, 2006). Sorkin coins the term Disneyfication on homogenizing public spaces, which allows corporations to control certain aspects of pseudo public spaces such as malls. (Sorkin, 1992)

Fjellman states that although Walt Disney always thought of

himself as an entrepreneur and entertainer, in his later years he acquired the labels of moral educator and urban planner as well (Fjellman, 1992). In a larger sense, Disney World would not only be a theme park, it would also showcase the EPCOT Center (Experimental Prototype Community of Tomorrow), a utopian model of modern urban life, a celebration of technological rationality and the virtues of a Corporate-designed future (Giroux, 1999) presenting a consumer culture driven fantasy version of not only of public space but of the larger world view itself.

Corporations are continuously in the process of acquiring and controlling public spaces in various forms, to the extent that people become unaware that public space has the possibility of existing without corporate presence. Kemmis states that the problem is that corporations have grown so powerful in both the economic and political spheres that they are often able to dictate terms to the very public which allows them to exist in the first place (Kemmis, 1990). Case mentions that, as consumers replace democratic citizens we are losing sight of the possibility for public space and a public sphere that creates a public that, being closely tied to its surrounding environment, is based on patterns of relationship between the differing viewpoints of all its citizens. (Case, 2006)

3.4. The Need of a Regenerative Intervention

Within the discourse regarding place, the intention was to establish that meaning and identity-privacy territoriality and control of place- place as a commodity- are major considerations that must be taken in studying, designing as well as using public places.

The way public space is perceived depends upon its meaning and identity. Meaning in place can be established on a regional, contextual as well as a cultural bias. The public space in Kandy, which is the focal point of this study clearly lacks of any such meaning or identity. The space is used by the public (if and when used by the public) as a transitional link between places, when it, itself has been designed with the primary intention of creating a community space. However it should be also noted that this link is seldom used by the public, due to the lack of maintenance and concerns of safety. Apart from creating a dysfunctional link between places it does nothing to relate to the context. Located within the historic hub of the city the space does not relate, at least symbolically, to the cultural or regional significance of Kandy. The space is conceived as a disproportionate thoroughfare with conspicuous seating niches affording pseudo private spaces within a public space, which at a glance seems a contradictory notion to be applied. Public places should remain public, and private places should remain private, the predicament transpires when either of

these flow into the other. Responsibility of maintaining public spaces in Kandy remain with the local authority. The social norm is that the controlling power should represent the interest of the majority public. In this context it would be pertinent to question the position of the homeless. Does the homeless belong to the larger public sphere? How does the local authority deal with these types of issues? Can government guerilla tactics in promoting anti-homelessness used in Japan be used in Kandy? (Should it be used anywhere?)

Taking into consideration the above mentioned reasons it is clear that a regenerative intervention is needed in transforming this ill defined, placeless, dysfunctional public space into a functional space which not only creates links with the cultural and physical fabric of the city but provides a much needed social-scape for public interaction. This study considers digital media interventions as an urban regenerative tactic. Several questions arise as to how and why digital media might be incorporated into the urban fabric of the city.

1. What role can digital media play in rehabilitating dysfunctional urban public spaces in Kandy, Sri Lanka?
2. What are the digital media technologies available to make a dramatic change in the urban context?
3. How have these technologies been adopted in public spaces?

4. Digital Media and Human-Media Interaction

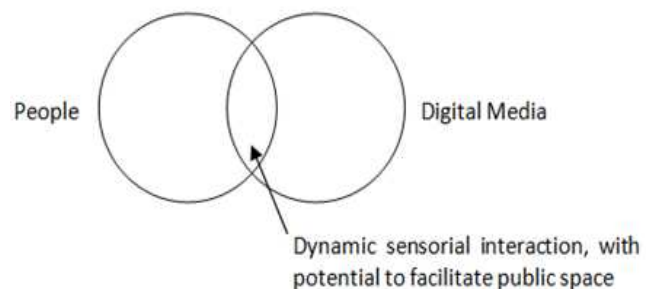


Fig. 4. Interaction between people and digital media.

“Public space is an old habit. The words public space are deceptive; when I hear the words, when I say the words, I’m forced to have an image of a physical place I can point to and be in. I should be thinking only of a condition; but instead, I imagine an architectural type, and I think of a piazza, or a town square, or a city commons.”

-Vito Acconci, from “Public Space in a Private Time”, in Critical Inquiry 16,

University of Chicago, 1990

Altman states that making public spaces just like the old ones can't bring back the old public life for which we have such nostalgia. They were part of a different ecology one that has changed and we need to look at the new ecology that surrounds public life in our towns and cities in search for new appropriate forms (Altman and Zube, 1989) the role of the public space has changed. How people interact in public space has changed.

Urban milieus have transformed radically in recent years at the same pace as the thoughts and concepts about how they should be designed, changed and developed. The meaning and implications of place have weakened as the routes of communication between locations have evolved. William Mitchell (Mitchell, 1996) elaborates on how the traditional gathering space around the watering hole disappeared. Mitchell goes on to say that the advent of pipe borne water has led to the demise of the watering hole/well community. Mitchell describes how technology made this change and how its changing the way people interact in public spaces, he derives conclusions as to how this same technology has resulted in killing conventional public space, giving birth to new public space of cyberspace. (Mitchell. W, 1999) Has conventional public space died? Will people completely abandon the old public spaces in favor of the new ones? The introduction of modern technology has formed a new generation of public spaces and it is in the process of changing our perception of public space

Scot McGuire in "the politics of public space in the media city" states that the public domain of the 21st century is no longer defined simply by material structures such as streets

and plazas. But nor is it defined solely by the virtual space of electronic media. Now they present themselves as an interaction of both the physical and virtual spaces.

Don Mitchell states that the very nature of space has been transformed by developments in communications technology (Mitchell. D, 1995). He maintains that the electronic space of the media and computer networks has opened a new frontier of public space in which material public spaces in the city are superseded by the fora of television, radio talk shows, and computer bulletin boards. He further Quotes Carpiignan who sates that "the media today is the public sphere, and this is the reason for the degradation of public life if not its disappearance" he further quotes Carpiignan who mentions MMG (mass media group) argument that the evolution of television talk shows has transformed "the public" from an audience for mass politics and entertainment into a discursive, interactive entity. TV talk shows "constitute a 'contested space' in which new discursive practices are developed in contrast to the traditional modes of political and ideological representation". Immersed within the unreal realities of television and other mass Medias, new concepts of public participation and public interaction have surfaced. These remote public spaces afford the creation a new consumer driven social sphere, manipulated by cooperate agendas, and political biases. Mitchell on electronic public spaces further states that reliance on the media as the entree into the public sphere is dangerous since Media in the "bourgeois public sphere" are privately owned and operated for profit. Consequently, subordinated social groups lack equal access to the material means of equal participation (Mitchell. D, 1995).

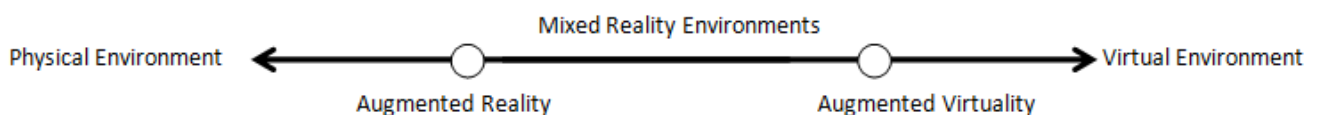


Fig. 5. Virtuality-Reality Continuum adopted from Milgram and Kishino, 1994.

McGuire (McGuire, 2008) argues that the spaces and rhythms of contemporary cities are radically different to those described in classic theories of urbanism. This study focused on how these classic theories maybe reinterpreted using facets of digital technology. The use of digital media in our daily life has not only dramatically changed the way in which we live but also how we perceive the city as well as the world. Adopting digital media through these theories present the opportunity to create dynamic and changing patterns within the urban fabric. The new media offers a multitude of spheres such as interactivity, responsiveness, dynamicity and intelligence to experiment within the urban context, with minimal impact to the physical structure of the city and minimal economical impact. McGuire describes the

contemporary city as a media-architecture complex resulting from the proliferation of specialized media platforms and the production of hybrid spatial ensembles.

Taking into consideration the multifaceted digital medium, few questions can be raised with regard to the new form of public space. Can digital media enhance public space, its use and enjoyment? Can it make public spaces more meaningful or productive? Can digital media create public spaces which are more flexible and adoptable to the user? (Can it be user specific at all?) What would be the control strategy for these types of public spaces? And who would be the controller?

4.1. Conceptualizing Digital Media Interfaces

The overlaying of physical space with dynamic data (Manovich, 2006) or superimposing media and information upon the urban environment (Allen, 2008) to create enhanced settings which are both culturally significant as well as dynamic, adds a new dimension to the existing urban fabric, filling inconsistent gaps and strengthening the overall cohesiveness.

Ole Bouman identifies four main types of digital interventions which can be used in the built environment to enhance its dynamic quality. He notes Moving surface, Interactive surface, Architecture online, and Internetted Architecture as the four interventions. (Bouman, 2006)

Bourman describes moving surface as a method in animating the fixed, rigid architectural monoliths and making them ever lighter and dynamic. Manovich breaks down the moving surface in four categories according to its usage: Contemporary Urban Architecture, Video displays in certain contemporary spaces (Eg: Exhibitions), Retail Environments and Music Performances (Manovich, 2006)

Usage of the moving surfaces in urban settings can be seen in various locations ranging from the Times Square to Fremont Avenue in Las Vegas. The use of these surfaces, specifically as artistic expressions is seen in the works of Diller+Scofillio. In the installation named Jump-Cuts they tried to express the internal function of the building by using external liquid crystal display screens: merging of the architectural interior and exterior. Shop fronts displaying TV screens are a common sight in Sri Lanka when cricket matches are televised and these shop fronts become dynamic hot spots, throbbing with life, laughter, and cheer.

Using recording devices, sensors, heat detectors, etc. a surface can be transformed into an interactive element where communication is a two way process. The possibilities of the interactive surface range from the interactive paint color chooser at the local hardware store to complex interactive surfaces such as dECOI's hyposurface. Using technologies such as bio-feedback processing the future of interactive surfaces are rich with prospects.

Bouman discusses connecting places/spaces/architecture via electronic networks to make them accessible not only in its fixed context but ubiquitously. Vectoral elevation was such an interactive installation which transformed Maxico city's historic center with light patterns emanating search lights controlled by people all over the world through the internet (Bouman, 2006)

The fourth architectural intervention that Bourman proposes is virtual space, where physical spaces are connected within

an online setting. Helen Stucky describes the case study of a virtual space which replicated the actual physical ACMI Park in Melbourne, Australia. (Stucky, 2005) the study would be limited to the first three types of digital interventions which are termed Augmented Reality Systems.

Digital technology is capable of revolutionizing the way we perceive public space, creating links and giving meaning by way of arranging functions and character of public spaces. Even though the digital revolution has predicted in some instances that the physicality of the city would be overtaken by its virtual counterpart indications of this has not been prominent (Aurigi et al., 2008). Aurigi et al states that the digital and the physical environments have come to define each other and concepts such as public space and "third place", identity and knowledge, citizenship and public participation are all inevitably affected by the shaping of the reconfigured augmented urban space (Aurigi et al., 2008).

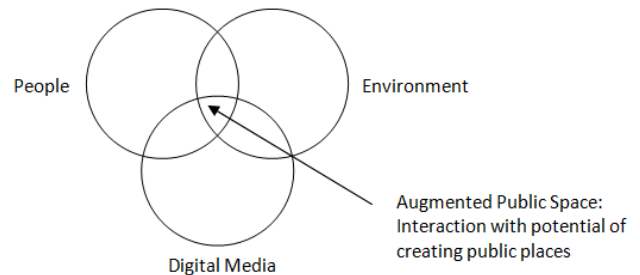


Fig. 6. Interaction of people, environment and digital media.

4.2. Modalities of Augmentation

Aurigi et al states that it is increasingly evident that the gradual development of an enriched media environment, ubiquitous computing, mobile and wireless communication technologies as well as the internet as a non-extraordinary part of our everyday lives are changing the ways people use cities and live in them (Aurigi et al., 2008).

Lee states that one of the outstanding effects of mobile phones is that they tend to blur the boundaries between binary realms. For example the boundary blurring process between public and private spaces by mobile networks has been underlined by many researchers (Lee, 2008). He states that due to the development in mobile technology it is not their physical presence that decides whether people occupy public space or private space, it is their choice. The ubiquitous networks allow people the luxury of controlling their presence within the network. Instead of having prominent video surveillance devices the augmented environments would inspect the digital presence. The increasing of surveillance increases the public-ness of place. Taking Seoul, Korea as an example Townsend states that The integration of broadband technology into public space can, and should, reflect deeply held values and social norms about

public behavior, the built environment, social relationships, and privacy (Townsend, 2008).

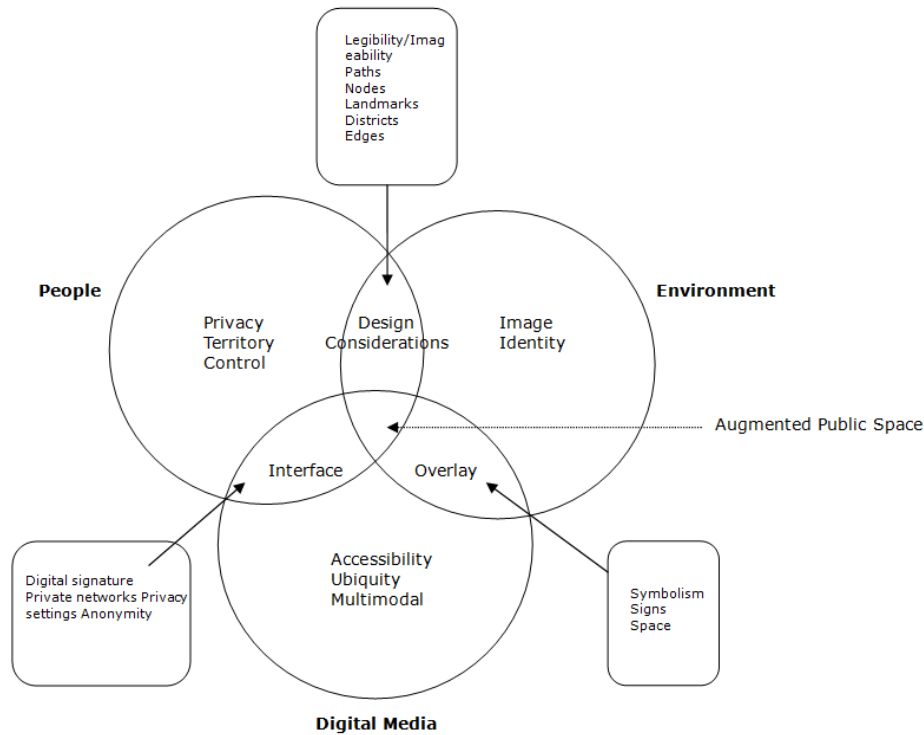


Fig. 7. Augmented public space.

Identity is an important factor when interacting within a community. Mitchell describes his identity within digital space, `wjm@mit.edu`, as both his name and address (Mitchell, W. J, 1996). Navarrete et al., states that When members feel they have an identity within a community, they are more conscious of their participation; therefore the quality of participation increases and that in hybrid communities, participants' voluntary decision to reveal their identities (including personal and private information) in spite of the public nature of the Internet might be related to the already existent base of trust established in the real world relationships among the members of the community. (Navarrete et al., 2008) The identity within these communities become the individuals personal territory, and the Identity of the individual in turn moulds the identity of the place.

Similar to the physical environment having fluctuating parameters for becoming a successful place, the combination of the digital overlay brings about new parameters in creating the experience of place. Milligram (Milligram et al., 1994) proposes three parameters for augmented reality environments which provide real, immersive and direct experiences. Extent of World Knowledge is the amount that the individual is made to understand about the environment. This would provide the user with basic information regarding the environment. As the extent of world knowledge increases,

the sense of presence and the immersiveness of the augmented environment heighten for the individual. Reproduction fidelity is the quality of the projected augmented environment. As the quality of the environment increases so does the amount of immersiveness. The third parameter is extent of presence metaphor, which presents a means of classifying egocentric differences between mixed reality environments. These three factors contribute to the augmented environment in order to create a sense of presence and provide meaning to the given place. The combination of these three parameters provide the user the necessary elements in placing themselves within that augments space or regulates the amount of immersiveness.

Augmented public space presents a fertile ground for corporate intervention, and its use in the present exemplifies this aspect. In fact it can safely be said that the field holds much promise as a marketing tool than a place enhancement tool. Traditional modes of marketing such as product placement and user specific advertisements are few examples which are being incorporated within Augmented Reality systems.

In the context of the given public space which does not support public activity and acts as a repellent rather than a catalyst of social interaction is the very epitome of dysfunctional public space. The exaggeration of privacy and

the lack of public-ness equally aggravate the situation. Being a place without proper hierarchy or physical demarcation the space lacks imageability or legibility. Symbolically or physically the spatial arrangement lacks any relationship to the surrounding physical or cultural context. Encircled by the city but lacking any commercial involvements, the space does not offer the public a single reason to congregate within its ill-defined boundaries. It is in this context that a design intervention is needed, both in physical form and digital form: a hybrid design intervention augmenting the public space.

4.3. Use of Mobile Augmented Reality in Urban Design

Augmented reality systems have been in use since the 1960's. The first documented augmented reality system was created by Ivan Sutherland which was a very basic head mounted display system. However the term "Augmented reality" was

first used by Tom Caudell and David Mizell in 1992 in one of their academic papers on the theme of augmented reality.

Since then there have been many developments in terms of augmented reality systems such as Daniel Wagner and Dieter Schmalstieg's first stand-alone Augmented Reality (AR) system with self-tracking running on modified personal digital assistant (PDA) with a commercial camera. They had used a marker-based tracking toolkit (ARToolKit), which runs directly on the PDA (Wagner et al., 2003).

With the increased use of new generation mobile phones more mobile phone applications which use augmented reality technology have surfaced. Applications such as Layar, Wikitude and Yelp uses GPS data in combination with wikipedia entries to provide detailed information about urban locations such as landmarks, restaurants etc.

Table 1. Comparative Analysis Matrix.

	Place Making Theory	Digital media and Human-media Interaction	Synthesis	
Physical	Identity	Legibility/Imageability Paths Nodes Landmarks Districts Edges	Identity through-personalization Variation -Identity and image attained through personal identity -Lynchian aspects projected through multimedia	
	Meaning	Symbolism Signs Space	Accessibility Ubiquity Iconography Multimodal -Meaning is personalizable -Accessibility provides individualized meaning to be acquired through digital symbols -Universal, cultural and personal meanings are generated according to need	
Psychological	Privacy	Niches Enclaves Personal space	Digital signature Private networks Privacy settings Anonymity -Digital signatures protect privacy creating personal niches within the space, separated yet united within the network -Anonymity provides the ultimate level of privacy	
	Territoriality	Life space boundaries	Zones Networks -Community networks create territories to groups. -Individual territories connected through networks	
Economical	Control	Surveillance Power Filtration	Authentication Monitoring -Controlling of community through authentication-digital surveillance -Accessible only to a selected -Monitoring of data flow	
	Commodification	False identity Fantasy Unrealistic values Retail	Tourism Visitor information -Using the tool as a commodity to market the city	
	Commercialization	Advertising	Product Placement	-Product placing provides a mode of commercializing
		Marketing Brand making Information	Customized Advertisement Online retail	-Customized Advertisement placement -commercial interventions allow the place to be self sufficient.

5. Concluding Remarks

The Greek philosopher Heraclitus states that "There is nothing permanent except change" and it is this permanency in change that we see at work in our cities. These are the new hybrid cities, consisting of part virtual and part physical elements. The laws of urban science are changing together in harmony with the times.

In these urban places, Identity and meaning hold both physical and virtual connotations, except that there is no boundary between these two ends. The study focuses on how to provide meaning and identity using the overlaying digital landscape. This multifaceted digital overlay provides privacy and autonomy within a public sphere, even though monitored by digital surveillance networks. The public space truly has become a stage of democracy, Control no longer is in the

hand of an unseen agent of the public, where the user has the control over his environment in choosing what they want to experience and not what they are expected or made to experience. The ubiquitous network considered every one equal in public place.

Still questions are being raised as to who has the leash of control over the information carried within these networks? Who will plunder these new lands in the name of consumerism?

The study was done with the primary intention of examining methods of regenerating a dysfunctional public space in Kandy, Sri Lanka. At the end of the exercise Augmented Reality Systems (ARS) can be seen as urban interventions which cause minimal impact on the existing urban setting, yet having significant impact upon user perception. An additional issue that the study focused was creating cost effective urban regeneration interventions. Augmented Reality Systems bear minimum installation cost since only the application development is required.

The importance of public space is widely recognized, in terms of rejuvenating public life as well as enhancing the image of the city. A good public space creates a healthy economic setting for the city as well as a healthy state of mind for its citizens. Hence it can be safely concluded that good public spaces creates good city form. Future research in this direction could be seen regarding Augmented Urban Catalysts which regenerate dilapidated urban forms. It would also be interesting to investigate the effect of cognitive mapping abilities and motor-object skills within augmented public spaces considering Activity Theory as a base which highlights that activity may be thought of as a subject's interaction with his or her surroundings.

The main obstacle in terms of the study is seen as a substance of aesthetics. The main challenge architects face in terms of aesthetics is, articulating the juxtaposition of different spaces, where as Augmented Space adds an extra dimension and challenges the architect to combine spaces which overlap each other. The overlaying of different spaces might be more problematic than treating the junction between two physically separate spaces.

Even though there may be a number of ways that a public place could be rejuvenated the study proposed the use of digital technology, specifically Augmented Reality Systems, in achieving this objective, while trying to present a case for cost effective urban regenerative interventions which inflicts minimal impact upon the existing physical structure. It should be noted that even though the study touches upon broad subject areas such as place and place theory, information presented herein has been reduced to what is pertinent to the questions at hand.

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