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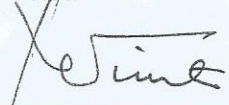
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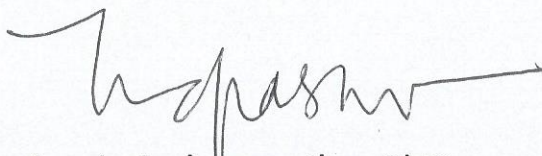public engagement and the making of place

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public engagement and the making of place

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PUBLIC ENGAGEMENT AND THE MAKING OF PLACE

PROCEEDINGS

Volume 1:
Creative Engagement Through Design Praxis
Digital Technology Enabling Public Engagement

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reflections on creativity: public engagement and the making of place

Proceedings

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PREFACE

The fifth biennial Arte-Polis International Conference between the 8-9 August 2014 brings together to Bandung, Indonesia, creative champions from different places around the world, to share and learn from each others creative experiences in the making of places.

Under the theme of *Reflection on Creativity : Public Engagement and The making of Place* Arte-Polis 5 underlines the importance of city as more than spatial projections of urban imagination but reflection of the creative energy, network, quality of living and traditions of its people. It refers to Creative Community and Place-Making within the frame of community participation, democratization process and their reflections in spatial structure, planning, ethic, policy-development, education, business, environmental discourse and ICT.

The aim of Arte-Polis 5 is to connect together practitioners, academics, community leaders, government officials, policy-makers, artists and other creative professionals from diverse disciplines and regions around the wh shares concerns about the quality of life and the connected nature of creative communities in urban, rural and pastoral places, particularly in response to contemporary situations of globalization, neo-liberal economy, digital technology, environmental issues and the positions and role of society and public realm in the discourse of creative community.

Keynote and Featured Speakers provide a platform for discussion of Conference theme to be elaborated in parallel sessions of the Conference Tracks:

Christopher SILVER, Prof- Professor and Dean of College of Design, Construction and Planninh, University of Florida, USA
Clorinda ROMO - Co-Founder, City Laboratory of Mexico City, MEXICO
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In this publication, Parallel Session papers are compiled to provide an insight for reflection and sharing of the best practice experiences from over 11 countries. We trust that you will find Arte-Polis 5 International Conference on Arte-Polis 5 *Reflection on Creativity : Public Engagement and The making of Place* a rewarding and enriching learning experience worth sharing.

The Editors
Arte-Polis 5 International Conference

CONTENTS

Interactive Multimedia in Public Space: The Changes of Activities and Spatial Patterns in Urban Space

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ABSTRACT

Nowadays the technology of interactive multimedia has been applied in various aspects of human life, which has changed not only the physical things but also the way we live. This technology offers interaction between people and the tools, and thus changes the pattern of interaction between people. If it is applied in the elements of human space, the meaning of space will be changed and enriched. In this paper, I focus on the application of interactive multimedia technology in the elements of urban public space. Some case studies are explored to know how interactive multimedia technology can be applied to the elements of public space, how interactive multimedia elements can be used to encourage public activities and howinteractive multimedia gives new meaning to urban public space. Interactive multimedia technology can change the elements of public space by using light, sound, smell, texture and movement to create the desired condition. This dynamic spatial pattern will encourage people to do some new activities pattern in urban space. Interacting, connecting, seeing and being seen, playing and watching are some new activity patterns in this new public space. Therefore the application of interactive multimedia can make people feel new experiences of a dynamic space in urban public space.

Keywords: *interactive multimedia, urban, public space*

INTRODUCTION

Interactive multimedia technology has influenced many aspects of human life from the smallest to the largest things. It has been appliedboth in private and public domain which offers new types of interaction between people and tools based on computerized systems. Thus the effects of this interaction will change the physical things (the spaces we live) and the non-physical things (the ways we live)whichcan give positive or negative impacts to human life. According to Lang, the changes of environment generally may influence some aspects, such as: micro-climate, the spatial configuration of the settings, the three-dimensional positioning of space and/ or the nature of the partitions, the environmental hardware, environmental attributes, the symbolic attributes of spatial configurations, materials, objects and/or the position of these elements within the settings (Lang, 1994). If interactive multimedia technology is applied in the largest scale (such as in public realm), the effects will have greater impacts in changing the patterns of the environment and behavior patterns of people.

The important thing that influences the changes is the dynamic effect of interactive multimedia technology. Thus the elements of space can be dynamically changed relating to two – way interactive systems. In this paper, I will focus on the application of interactive multimedia technology in the elements of public space.Besides another terms of public space (refers to internal public space, and external and internal-quasi public space), the term of public space here refers to "a piece of land that lies between private landholdings, such as squares, streets, highways and parks (external public space)", as Carmona, et.al, define it as"the purest form of public space" (Carmona, et.al, 2003). Furthermore, the objectiveof this paper is to knowthe relationship between interactive multimedia technology and public space, particularly in relation to the changes of activities and spatial patterns in public space. The application of interactive multimedia technology in public space are explored in some case studies to know how interactive multimedia technology can be applied to the elements of public space, how interactive multimedia elements can be used to encourage public activities and how interactive multimedia gives new meaning to urban public space.

INTERACTIVE MULTIMEDIA AND PUBLIC SPACE

THE CONCEPT OF INTERACTIVE MULTIMEDIA

Interactive multimedia has significantly developed in the last centuries and has become either one of human need or life style. According to Encyclopedia Britannica, this advanced interactive system has been used since mid 20th century, become popular in the early 1990s and commercially used by the mid 1990s (http://www.britannica.com/EBchecked/topic/289959/interactive-multimedia, retrieved on March 5th, 2014). Kachornnamsong defines interactivity as "a recurring process between actors – the feedback loop between them stimulates a spontaneous reaction – one's activity is inconsistent with the other's performance" which is not only a way of making oneself seen by others but also to become a part of the work" (Kachornnamsong, 2013). Moreover, the term of multimedia refers to the use of a combination of media or various

communications media simultaneously which combines text, graphics, full-motion video, and sound into an integrated package (http://www.thefreedictionary.com/multimedia, retrieved on March 5th, 2014).England and Finney define interactive media as "the integration of digital media including combinations of electronic text, graphics, moving images, and sound, into a structured digital computerized environment that allows people to interact with the data for appropriate purposes"(England and Finney, 2011). Interactive multimedia application shifts the user's role from observer to participant and is considered the next generation of electronic informationsystems(http://www.britannica.com/EBchecked/topic/289959/interactivemultimedia,retrieved on March 5th, 2014).

Bullivant emphasizes that "multi-mediated interactive design is already entering every domain of public and private as a spatial medium, revolutionizing and reinventing our work, leisure and domestic spaces" and becomes new type of physical matter which can"reinvent our perception of space" and blur the boundaries but "does not obviate the human need for place" (Bullivant, AD Magazine, 2005). Hence the most important things of interactive multimedia system are the concept of interactivity (interaction between people and interaction between people and tools) and the combination of various media in an integrated system.

THE CONCEPT OF PUBLIC SPACE AND PUBLIC LIFE

There are two important aspects in public realm, as Carmona, et.al.define that "the public realm has 'physical' (space) and 'social activity dimension.' According to them "the physical public realm is understood as the spaces and the settings that support or facilitate public life and social interaction"(Carmona, et.al., 2003), whichfunctions have been developed as "a forum for political action and representation, "a neutral" or common ground for social interaction, intermingling and communication, and a stage for social learning, personal development and information center"(Loukaitou-Sideris and Banerjee, 1998). Moreover, accommodating different users and uses are also a condition of a successful public space (Carr, et.al., 1992).

Furthermore, Banerjee explains that the concept of public life is derived from the desire for relaxation, social contact, entertainment, leisure, having a good time (Banerjee, 2001) liveliness, engagement with the life of a city or to take a brief pause from the routines and demands of city life (Whyte, 1980) which can cover "physical, social and physiological needs" (Carr, et.al., 1992). In this case,"understanding activity pattern and considering how to encourage activities through different time periods and how to achieve synergies from activities happening in the same space and time" should be known to create a successful public space (Carmona, et.al.,2003). Thus the design of spaces in public realm must be integrated with the total environment (Trancik, 1986), so that specific variables of physical aspects and social activity dimension of each public spaceshould be considered in using interactive multimedia technology.

INTERACTIVE MULTIMEDIA IN PUBLIC SPACE

When interactive multimedia meets public space, the changes willaffect the spaces, the people and the program activities. People participation is the most crucial thing and becomes a requisite for its existence in public space.

Furthermore, the application of interactive multimedia should consider some criteria of successful public space, such as: people movement (generally integrated within local movement system), aesthetically desirable and configuration of space, design features which support use and activity, visual permeability of a space, design of a center and design of the edge (Carmona,et.al., 2003).

THE TYPES OF INTERACTIVE MULTIMEDIA TECHNOLOGY IN PUBLIC SPACE

Choosing the right type of interactive multimedia becomes the essential things which can influence how people experience the public space and interact with others. As public spaces may consist of many things, the application of interactive multimedia technology in public space may be merged into many forms, such as public displays, installations, public arts, street furniture, signage, and many possible forms in public space.Hinrich emphasizes that there are some aspects which influence the types of interactive multimedia technology in public space, such as: spatial layouts of public settings, sizes, lighting conditions and social connotation (Hinrich 2013).Buerger sees interactive multimedia application based on the number of users in public space, which can involve single and multi-users (Buerger, 2011).

In combination with other mobile devices, he also sees the operational of interactive public displays into two systems, such as public display in combination with mobile device and standalone public display(Buerger, 2011). Müller, et.al see interactive multimedia application in public space from the different types of sensors which enable different types of interaction modalities, such as: presence, body position, body posture, facial expression, gaze, speech, gesture, remote control, keys, and touch (Müller, et.al, 2010).In choosing the types of interactive multimedia, we have to consider characteristic of users to avoid "display and interaction blindness" (Houben and Weichel, 2013). The blindness can make people ignore to use interactive multimedia application in public space. It has to have integration with other elements of public space as a system, and have to be easily accessible and understandable for common users. It is also a must to consider the characteristic and the use of public space, so that interactive multimedia can deal with different issues in each public space.

Table 1. Some Types of Interactive Multimedia from Different Criteria in Public Space
Source: Buerger, 2011; Müller, et.al, 2010

	Some Criteria of Interactive Multimedia In Public Space		
	Interactive Multimedia and The Number of Users (Buerger, 2011)	Interactive Multimedia in Combination with Other Devices (Buerger, 2011)	Interactive Multimedia and Interaction Modalities (Müller, et.al, 2010)
The Types of Interactive Multimedia in Public Space	- Single-user - Multi-users interaction: • parallel use: interacting simultaneously and parallel next to each other • teamwork and playful activities: acting as teamwork which relates to the same object • conflict management: occurring when users intrude the territorial boundaries of others • floor and turn-taking: observing actions of others • expressive and pondering: signaling other users that they are busy, so that other users must wait for more suitable moment to use the interactive object	- Standalone public display: users need no additional device to interact with the public display - Public display in combination with other mobile devices: users need other mobile devices, which can be extended input device, pointing device and integral part of the interaction, to interact with public displays	Different types of sensors enable different types of interaction modalities, such as: - presence: "getting the users to be involved into interaction with the display" as an implicit interaction - body position: "displaying or updating content close or in relation to the user's position" - body posture: body orientation and position as well as proximity to be used to assess the way a user approaches a display" - facial expression - gaze - speech - gesture - remote control: "allowing users for browsing, adding or modifying content" - keys: "providing easy means for enabling interaction with a public display" for example by a standard keyboard or mouse" - touch "enabling direct interaction by manipulating objects'

INTERACTIVE MULTIMEDIA AND THECHANGES OF ACTIVITY PATTERNS IN PUBLIC SPACE

Activity patterns in public space determine the quality of public space. According to Gehl there are some factors which can influence activity patterns in public space, such as: physical environment, connection with other activities, and physical planning (Gehl, 1987). The application of interactive multimedia technology will certainly change people's behavior and activities, because people do not only interact with others but also interact with the tools. Williamson, et.al, see that interactive multimedia technology can trigger interaction by using "large public displays, proxemic and whole body interaction using depth and motion sensors and large tangible interfaces"(Williamson,et.al., 2013). This interaction may alter any types of activities pattern in public space, which Gehl divides them into three categories: necessary activities, optional activities and social activities.Therefore, Gehl emphasizes that "when the quality of outdoor area is good, optional activities occur with increasing frequency" (Gehl, 1987).These activities patterns are influenced by the reasons of what people's needs in public space, such as: "comfort, relaxation, passive and active engagement with the environment"(Carr, et.al., 1992).

Furthermore, Müller, et.al. explorethat people can approach interactive

multimedia into some phases, such as: passing by, viewing and reacting, subtle interaction (users can interact with the display through gestures or movements), direct interaction (users engage with the display in more depth or position themselves in the center in front of it), multiple interaction and follow up actions (Müller, et.al., 2010). Thus, he emphasizes that interaction may be divided into different threshold according to each phases, such as (Müller, et.al., 2010): raising attention of passers-by (the first threshold), raising curiosity of onlookers (the second threshold) and motivating the people (other possibility threshold). Some interactive multimedia applications encourage people to do physical activities and trigger interaction in public space which relate to "social embeddedness and playful persuasion" (Sturm, et.al, 2013). How interactive multimedia applications influence activity patterns in public space is determined by the type of interactive multimedia and how people use this technology. If interactive multimedia application successfully encourages people to interact, it will make the quality of public space will be better.

INTERACTIVE MULTIMEDIA AND THE CHANGES OF SPATIAL PATTERNS IN PUBLIC SPACE

Saggio defines that "space is not an objective reality, but is perceived culturally, historically and scientifically in very different ways" (Saggio, AD, Magazine, 2005). In relation to architecture, Bauman emphasizes that the application of technology is "not only about designing the space but also about experiencing the space"and the products must be understood as "liquid, animating their bodies, hyper-surfacing their walls, crossbreeding different locations, experimenting with new geometries"(Bouman, AD, Magazine, 2005).

Thus the applications of interactive multimedia technology in public space make the space become more dynamic. In this case, public space is not only designed by the physical boundaries but also by the events and how people interact with each others.Bouman sees that spatialised moments are realised by "staging narrative, event designing and working with effects and emotion" (Bouman, AD, Magazine, 2005). Furthermore, interactive multimedia applications becomes the new elements of space, which is not only about "the temporalisation of space", but also "the spatialisation of time" (Bouman, AD, Magazine, 2005).

Saggio explores the fundamental concept of space and interactivity, which results in "a setting that can also react with and adapt toa shift in users' desires through the creation of scenarios" and "being constantly modifiable and forming a sensitive setting in constant transformation" (Saggio, AD, Magazine, 2005).The application of interactive multimedia can be added to the existing elementsor take many new possible forms in order to change or give more effects in public space.Thus the spatial patterns can be dynamically changed or modified according to the different issues and moment in each public space, based on people engagement in using this technology and interacting with others. It will influence human perception of space and effect people behavior in public space.

CASE STUDIES

INTERACTIVE LANDSCAPE: DUNE 4.2, ROTTERDAM

Studio Roosegard is internationally known for its interactive designs which explorethe dynamic relation between people, technology and space. Dune is one of its designs which is known as a public interactive landscape. The concept of Dune combines nature and technology which can interact with human behavior. This project consists of Dune X, Dune 4.0, Dune 4.1 and Dune 4.2. Dune 4.2 is 60 meter permanent part Dune, which is located alongside the Maas River in Rotterdam, Netherland. It utilizes less than 40 watts of energy (http://studioroosegaarde.net/project/dune/info/, retrieved on February 5th, 2014). DaanRoosegard designs it by using large amounts of fibers which can interact with the motion of pedestrians and sounds around Dune. It will physically brighten its appearance if it detects the presence of people through their motion and sound.
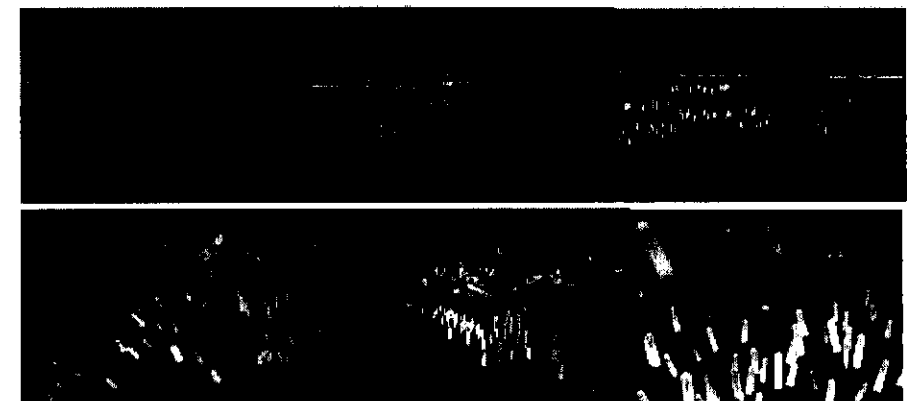

Figure 1. Dune 4.2, Maas River, Rotterdam
Source: http://studioroosegaarde.net/project/dune/photo/#dune, retrieved on February 5th, 2014

By inserting interactive multimedia to the landscape,Dune has changed behavioral patterns of people in public space. This interactive landscape can invite people to pause their walking activities to see and do something to the Dune, so that the activities patterns turn from necessary activities into optional activities and social activities. People do active engagement with the environment to discover the effects of this application individually or together with others. In Dune, people curiosity is emerged by seeing how others interact with the object and then exploring the visual effects. Then it can develop to passive contact (seeing other people)or to active contact (playing, greetings and making conversation with others).

In this case, interaction can be triggered by playful persuasion rather than social embeddedness. Besides the concept of interacting, the concepts of seeing and being seen, playing and watching activities become the new activities concept of Dune. The spatial patterns of path havealso changed in accordance with the patterns of Dune's application in public space. The change of lighting intensity

becomes the essential elements of space that gives new experience of space for people to walk in the light. The lighting of Dune becomes the spatial elements that dynamically characterize the public space which fits the environment.

ADAPTIVE BUS SHELTER: EYESTOP, FLORENCE

MIT's SENSEable City Lab designs EyeStop in collaboration with the Province of Florence and the local transportation authority ATAF, which functions as an adaptive bus shelter and a community gathering space. The concept of EyeStop as a smart urban furniture is developed by using the art sensing technologies, interactive services, community information and entertainment.In order to fit and blend with the characteristics of its physical surrounding, EyeStop is designed with minimalist design by using simple materials (steel, glass and gray local stone). It combines digital infrastructure and physical infrastructure, which are adaptable, sensing, responsive and interactive. This EyeStop consists of sound system, information design, ad with LED backlighting, wall for projections, interactive touch-screen, wireless mesh network, translucent photovoltaic cells, environmental sensors and LED lighting. Hence people can experience and do many things while waiting for the bus, such as: "planning a bus trip on an interactive map, surfing the web, monitoring their real-time exposure to pollutants, posting ads and community announcemen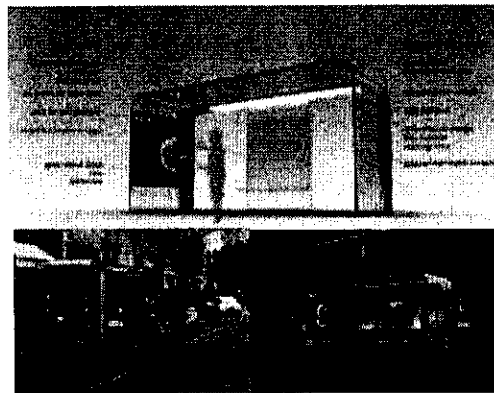ts" , besides "signaling the distance of approaching bus" (http://senseable.mit.edu/eyestop/ppt%20florence.pdf, February 5th, 2014).

Figure 2. The Concept of EyeStop as An Adaptive Bus Shelter
Source: http://senseable.mit.edu/eyestop/ppt%20florence.pdf, retrieved on February 5th, 2014

In this case, interactive multimedia technology is a part of public space which is inserted in street furniture and changespeople behavioral patterns in waiting for the bus. It also changes the activities pattern from necessary activities to optional and social activities, so that people can do many things while waiting for the bus. The need to discover many installed features in this EyeStop encourages people to doactive engagement with the environment. Gaining information and connecting with the real and cyber world through the interactive screen makeEyeStopas a place for interaction space. In this case, social embededdness and playful persuasion also trigger people interaction in EyeStop. From the spatial patterns,

EyeStop uses its physical elements as an interactive media for people to connect to something outside its spatial elements, but physically integrates and blends to the existing surroundings. In this case, the changes of spatial patterns refer to the changes of characters and functions of spatial elements.

INTERACTIVE LIGHT INSTALLATION: MOODWALL, AMSTERDAM

Moodwallis designed by Urban Alliance, as 24 meter-long interactive light installation, which is made from 2500 LEDs behind a ribbed semi-transparent wall and located in a pedestrian tunnel.
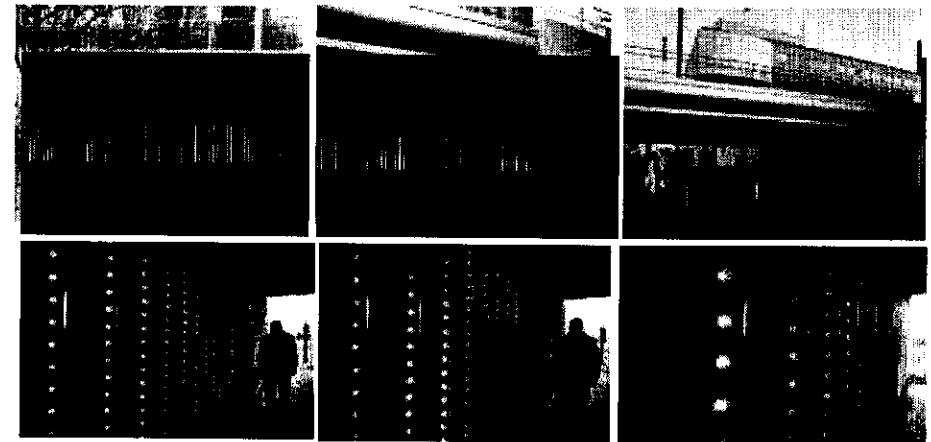
Figure 3.Outside The Tunnel, Moodwall, Amsterdam
Source: http://www.dezeen.com/2009/03/05/moodwall-by-urban-alliance/#more-25565, February 5th, 2014

It is designed in order to improve socially unsafe public space. The interactive light installation is inserted in the wall of the tunnel with a colorful light show which can interact with people who pass through the tunnel. This wall can interact with people by using its sensors to "pick up any moving object and portray an infrared-like image of the object on the wall" and then mimicking any movement with a colorful light explosion" (http://www.contemporist.com/2009/05/28/new-photos-of-the-moodwall-in-amsterdam/, February 5th, 2014). Moodwall can successfully create happier and safer atmosphere for the people inside the tunnel.

Moodwall changes the necessary activities patterns to the optional and social activities patterns, which can enrich walking experiences and increase the quality of public space. In this case, people are invited to stop and play with the light individually or in a group (active contacts) but others may do passive contacts by only seeing other people playing with the light. The need to discover their motion and lighting effects encourage active engagement to the environment. People will be curious to see the lighting effects and how others interact and use Moodwall. It is involved the concept of interacting, being connected and playful experiences with the motion and light. The changes of spatial patterns will be dynamically modifiable according to the motion of pedestrians and give different meaning of colors which alters human perception of space. The colors of lighting are never be the same because the combination of motion is never be the same, so that people will experience different color effects in the same space.
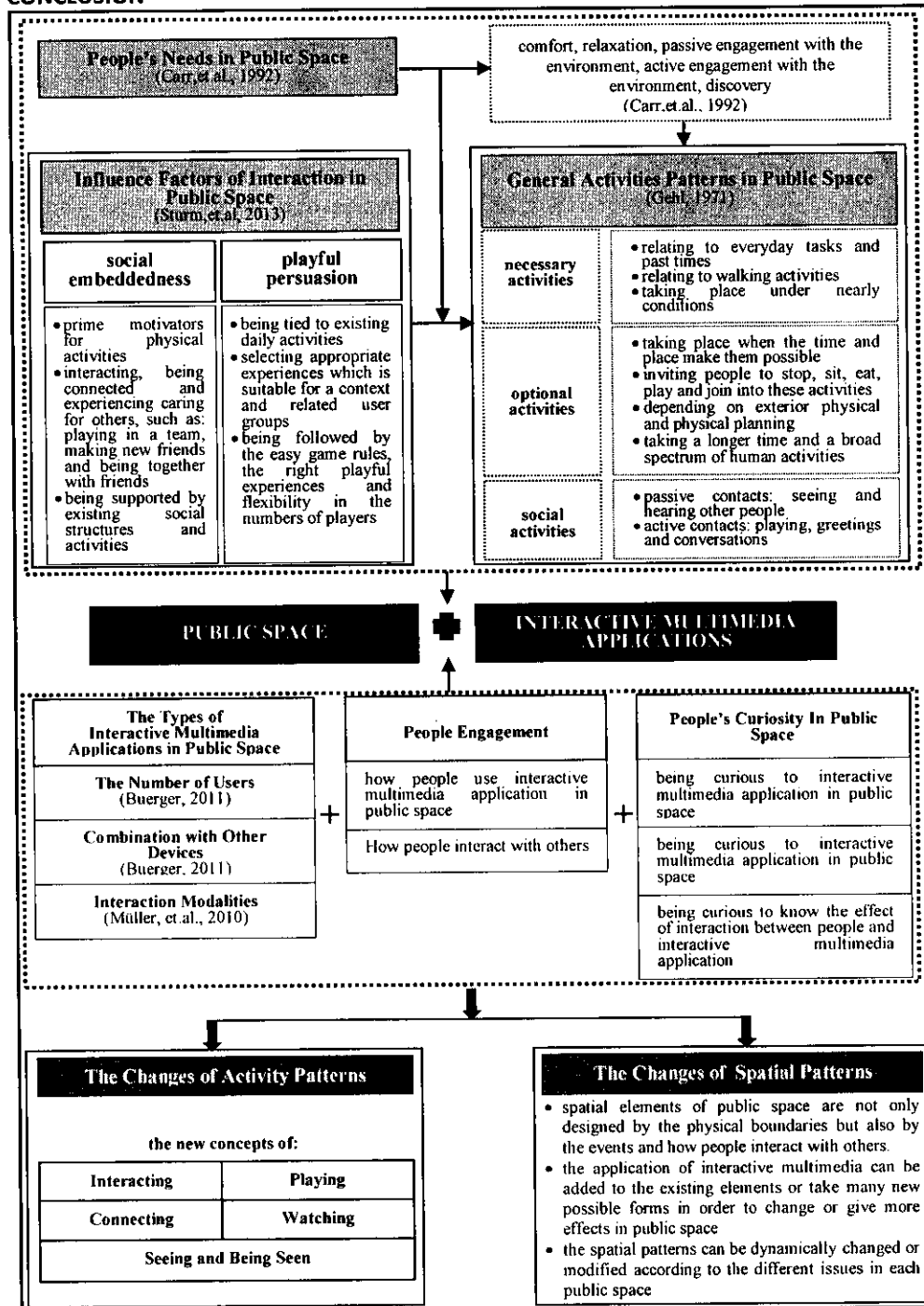
CONCLUSION

Diagram 1. Corellation Between The Elements of Public Space and Interactive Multimedia
Application in Creating The New Activities Patterns and Spatial Patterns of Public Space
Source: Carr,et.al, 1992; Sturm, et.al., 2013; Gehl, 1971; Buerger, 2011; Müller,et.al., 2010;
author, 2014

The application of interactive multimedia in public space can be applied in many possible forms, such as: the elements of boundaries, landscape, street furniture, urban art, installation, public display, signage, shelter, and any other possible forms. Nevertheless it can be added to the existing elements or take many new possible forms in order to change or give more effects in public space. They can increase the quality of public space by changing the necessary activitiespattern in public space into optional or social activities.

It is clear from the case studies that interactive multimedia application can trigger people to stop by and do public activities in enjoyable condition, such as interacting, playing, connecting, watching and seeing and being seen activities. Spatial elements become more dynamic because they are not only designed by the physical boundaries but also by the events and interaction. They can be dynamically changed or modified according to the different issues in each public space. Furthermore, some factors have to be taken into considerations before using interactive multimedia application in public space. The culture and habits of people become some important aspects which influence how interactive multimedia application can be used in different urban context. Thus the application of interactive multimedia may have different contextual approach. Diagram 1 shows corellation between the elements of public space and interactive mutimedia application in creatingnew activities and spatial patterns of public space.

BIBLIOGRAPHY

BANERJEE, Tridib (2001) *The Future of Public Space: Beyond Invented Streets and Reinvented Place*. Journal of The American Planning Association, The American Planning Association.

BOUMAN, Ole (2005) *Architecture, Liquid, Gas*. ARCHITECTURAL DESIGN, Vol 75 No 1 Jan/ Feb 2005. *4dspace: Interactive Architecture*. West Sussex: John Wiley & Sons Ltd.

BUERGER, Neal (2011) *Types of Public Interaction Display Technologies and How To Motivate Users To Interact*. Media Informatics Advanced Seminar on Ubiquitous.

BULLIVANT, Lucy (2005) *Introduction*. ARCHITECTURAL DESIGN, Vol 75 No 1 Jan/ Feb 2005. *4dspace: Interactive Architecture*. West Sussex: John Wiley & Sons Ltd.

CARMONA, Matthew, et.al. (2003) *Public Places Urban Spaces*. Oxford: Architectural Press.

CARR. S.,et.al. (1992) *Public Space*. Cambridge: Cambridge University Press.

ENGLAND, Elaine; FINNEY, Andy (2011)*Interactive Media – What's that? Who's involved?*ATSF White Paper – Interactive Media UK - ©2002/ 2011 ATSF.

GEHL, Jan (1987) *Life Between Buildings: Using Public Space (translated by Koch,J.)* New York: Van Nostrand Reinhold.

HINRICH, Uta, et.al. (2013) *Interactive Public Displayys*. IEEE Computer Graphics

and   Applications,   March/   April,   2013.
http://www.cs.helsinki.fi/u/jacucci/interactive.pdf, retrieved on February 5th, 2014

HOUBEN, Steven and WEICHEL, Christian (2013) *Curiosity Objects: Using Curiosity to Overcome Interaction Blindness.*ProceedingsExperiencing Interactivity in Public Spaces (EIPS) Workshop at CHI'13, April 28, 2013, Paris, France.

KACHORNNAMSONG, Nedine (2013) *Privacy Under Negotiation: Participation in Public Interactive Art.* Proceedings – Experiencing Interactivity in Public Spaces (EIPS) Workshop at CHI'13, April 28, 2013, Paris, France.

LANG, Jon (1994) Functionalism Redefined in Lang, Jon (1994) Urban Design: The American Experience, New York: Van Nostrand Reinhold.

LOUKAITOU-SIDERIS, A. and BANERJEE, T (1998) *Urban Design Downtown: Poetics and Politics of Form.* Berkeley, CA: University of California Press

MÜLLER, et.al.(2010) *Requirements and Design Space for Interactive Public Displays.* Firenze: MM'10 October 25-29

SAGGIO, Antonino (2005) *Interactivity at The Centre of Avant-Garde Architectural Research.* ARCHITECTURAL DESIGN, Vol 75 No 1 Jan/ Feb 2005. *4dspace: Interactive Architecture.* West Sussex: John Wiley & Sons Ltd.

STURM, et.al.(2013) *Playful Interactions Stimulating Physical Activity in Public Space.* Proceedings – Experiencing Interactivity in Public Spaces (EIPS) Workshop at CHI'13, April 28, 2013, Paris, France

TRANCIK, Roger (1986) *Finding Lost Space: Theories of Urban Design.* New York: Van Nostrand Reinhold.

WHYTE, William H (1980) *The Socio Logic of Small Urban* Spaces. Washington DC: Conservation Foundation.

WILLIAMSON, Julie R, et.al. (2013) *Low Resolution Displays for Performative Interaction in Public Space.*ProceedingsExperiencing Interactivity in Public Spaces (EIPS) Workshop at CHI'13, April 28, 2013, Paris, France.