EVALUATING THE ORGANIZATION OF URBAN ENVIRONMENTS THROUGH VIRTUAL MEDIA: THE EXAMPLE OF VIDEO GAMES

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Article Info	Abstract
	This study aims to bring the tangible but difficult to define concept of a dynamic urban environment together with that of an intangible but real static virtuality and to create a new information and discussion medium by combining their inherent dynamic and static natures. To this end, video games containing virtual urban environments have been chosen as the domain of this study.A conclusion was then reached that video games, as a virtual medium, can be defined as urban environments because of their inclusion of elements pertaining to real environments.

1. INTRODUCTION

Architecture is an art of illusion. Since ancient times, its existence depended on twisting human perception. Architecture is accretion, trial and error. It absorbs and stores all sorts of knowledge regardless of present applicability. And in the present day, architecture prefers to conduct its process of trial and error in a virtual environment. When talking of a virtual environment, many people think only of computers, but any environment which can be experienced spatially and perceived through sight, touch and movement is a virtual environment. And one example of a two-dimensional virtual environment is video games.

With a style that depends fundamentally on rules and yet is just as subjective; Architecture is, in its core, a game. The architect derives pleasure from the rules of her design process, its ever-expanding boundaries and the tension that comes from attempting to exceed them. This pleasure, in turn, takes an architect's potential to organize her environment for new life and makes it reflect on all environments she creates. Virtual and real environments; which are tools for exceeding boundaries as well as two domains that can not be reduced to each other, and appear completely distinct when one tries to take their intersection, are today experienced as one. Therefore, the usage of certain design criteria instead of previous knowledge of design is necessary in order to define them.

Urban environments are large-scale spaces equipped with architecture and re-envisioned using socio-cultural and environmental data. Hence, Bookchin [1] defined a city – the archetypal urban environment – as "A settlement whose socio-economic and cultural properties, state of governance and secondary social relationships lead to widespread social differentiation, specialization and mobility." [1] A city is also the product of many creators who continuously alter its make-up based on personal judgement. Though its outline stays constant over some period of time, the details are ever-changing [2]. The concept of a city is tangible relative to the concept of virtuality but also notoriously hard to define due to its dynamic nature. Throughout history, many different disciplines have provided their own definition of "Urban". Architecture, the discipline with the greatest physical contribution to urban environments, has also tried to define it and opted to do this using its own, real imagery. But lately, examples of virtual cities allowing

users to experience and re-organize urban environments have increased in prevalence. Amongst these examples are video games which include urban imagery and elements.

The scope of this study includes an investigation of whether urban organization in virtual and dynamic video games creates spatial perception. Lefebvre classified space as perceived, lived and conceived space; based respectively on sensory perception, experience and code in this example. This study attempts to determine whether virtual urban environments, designated as conceived space and defined in code, can be regarded as perceived or lived space; based respectively on visual elements and user experience. To this end, the existence of parameters and imagery associated with perceived and lived space has been examined.

A total of three video games were sampled with one including realistic contemporary urban environments, one including historical urban environments and one including urban environments created by the player; these samples were then analyzed using Kevin Lynch, Henri Lefebvre and Christian Norberg-Schulz's theories on spatial analysis.

With reference to these analyses, it was concluded that video games can be used as tools to break the boundaries between Henri Lefebvre's interpretation of conceived, perceived and lived space - allowing them to freely transform into each other. A conclusion was then reached that video games, as a virtual medium, can be defined as urban environments because of their inclusion of elements pertaining to real environments.

2. SPACE AND PARAMETERS NECESSARY TO UNDERSTAND URBAN SPACE

The beginning of Architecture is empty space. Architecture is the art of contrasts relating to the continuity of space. Essentially, the meaning of architecture is creating physical differences in space, based on our abilities and being able to sense these differences. Space can also be defined as "Physical boundaries existing in the material world, immaterial mental dimensions, perception and experience through time". Lefebvre considered space in three different laters; [3].

•The Perceived Space is the space which depends on spatial practices and can be physically defined using sensory organs. Short-term memory, being relatively objective and first-hand is used in interpreting the daily environment of people in the Perceived Space. The perceived space can be seen and observed empirically. It is also experienced first-hand before being conceptualized, like all other social practices and is reality itself. The perception of space is affected directly by the attributes of the perceiver as well as the space itself. [4].

•The Lived Space is a combination of the perceived and conceived spaces and represents the actual spatial experience of a person in daily life. It is lived through directly related images and symbols and is experienced based on long-term memory. Relations within the lived space are defined based on experiences within the space, movement-related perception, pathfinding/orientation, via recalling personal spaces, by using mindmaps and through memory and learning. Time and experience are the most important qualities of the lived space. It is perceived not only through its physical form but also by its socio-cultural aspects.

•The Conceived Space is a mental interpretation of the environment. It is the conceptualized or intangible space; in other words, the simile of a space. Spatial Conceptions are forms of practice and knowledge organizing and representing space. The conceived space is the equivalent of a conceptual space created by professionals and technocrats. Being homogenous, formal and quantitative, is either deletes or reifies all differences based on material existence. Architectural plans, city maps, metro lines, numerical speculations such as the Golden Ratio and Google Earth Maps are all examples of the Conceived Space. In virtual environments, it is formed using code or signs.

During this study, whether virtual urban environments that are a mental interpretation of space based on information and code could be regarded as space or urban environments was investigated. Thus, these parameters were drawn from the spatial analysis theories of researchers focusing on the spatial definition and perception of cities (Kevin Lynch, Christian Norberg-Schulz and Henri Lefebvre):
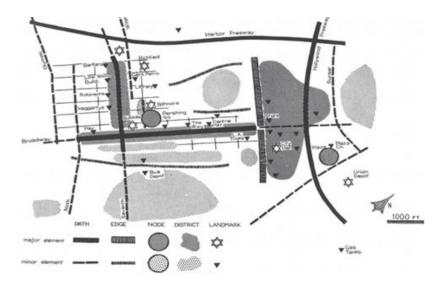
Kevin Lynch found that there are five basic elements which people use to construct their mental image of a city: Pathways Districts Edges Landmarks Nodes [2].

Paths, are the channels along which the observer moves. They may be streets, walkways, transit lines, canals, railroads.

Edges are the linear elements not used as paths by the observer. They are the boundaries and linear breaks in continuity: shores, railroad cuts, edges of development, walls.

Districts are the medium-to-large sections of the city which the observer mentally enters "inside of," and which are recognizable as having some common, identifying character. -

Nodes are points, the strategic spots in a city into which an observer can enter, and which are the intensive foci to and from which he is traveling. They may be primarily junctions or concentrations.
Landmarks are another type of point-reference, but in this case the observer does not enter within them, they are external. They are usually a rather simply defined physical object: building, sign, store, or mountain.

Picture 1 Kevin Lynch Parametres

Christian Norberg-Schulz's parameters are; [5].

An epicenter is the point of reference for a locale. All epicenters are the location of actions. As such, epicenters can be defined as the spatial unit for actions.

In every space, there is a concept of direction. Direction can be described in Euclidean Space as rotation based on vertical and horizontal axes. It defines a person's movement within the environment. A person's position in an environment begins by leaving the point of origin and throughout her journey, a road leads the person to her intended goal. Perceptionally and semantically, the defining characteristic of a road is its continuity.

Roads divide environments into unique areas (Defined by Schulz as "Fields of Interest"). In this regard, an can be defined as an unstructured "base" in which roads are defined. [5].

Spatial organization can be defined as a product of the relationships between these three parameters.

Lefebvre, on the other hand, defines urban environments in two distinct qualities: Morphological ones(areas and conditions, immovable property, streets and squares, monuments, local neighbourhoods) and Sociological ones(population density, age and gender demographics, households, active and passive segments of the population and socio-professionals) [6].

Lefebvre saw the base of the phenomenon of cities in centralization, by approaching it through the dialectics of construction and demolition, creation and destruction. According to Lefebvre, the city attracts everything belonging to nature and labour, born elsewhere, to itself and centralizes creations. On the other hand, it also creates everything. The city creates a situation in which different things create each other, preserving their differences but at the same time being are left unable to exist independently. Creating a locale while preserving their essence. In a city, nothing can exist without exchanges, convergence and intimacy: Nothing can exist without relationships.

Table 1 Parameters

	KEVIN LYNCH	NORBERG SCHULZ	HENRI LEFEBVRE
	PATHS	DIRECTIONS&PATHS	
	EDGES	EDGES	
	LANMARKS	LANDMARKS	SYNCHRONISM
	NODES		CENTRALIZATION
	DISTRICTS		RELATIONSHIPS

3.FIELDWORK

Cyberspace is now used in urban design along with multiple services in modern societies such as education, health and tourism. [7]. According to Mitchell, communication systems are replacing transportation systems with increasing speed and digital information is obsoleting traditional building styles. Forms which were once commonplace are slowly disappearing.

But the undeniable truth remains that so long as we keep living in a physical environment, the maps existing in our minds will not disappear. Furthermore, even if they appear to have separate functions, it is clear that we are merely projecting our previous knowledge in some manner to the cyber cities that we build. We can extrapolate from this data that the entirety of digital knowledge in the form of cyber environments can be put to use in urban design and planning, just like with all other disciplines and that this would allow us to live in better-organized cities.
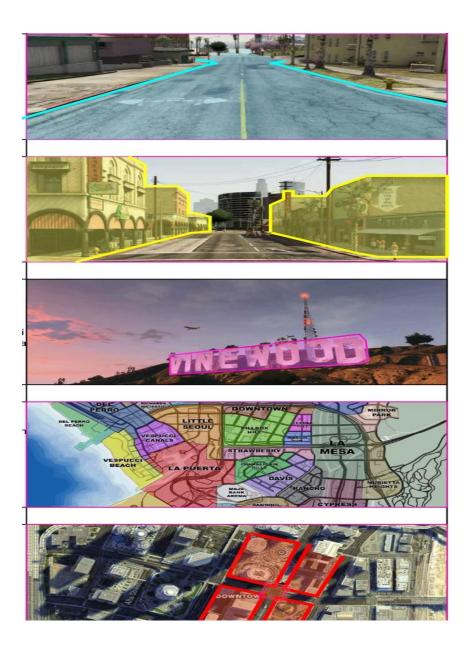
For these reasons, this study has attempted to evaluate how effective video games as a cyber or virtual medium are in our re-interpretation of cities and investigate whether urban organization in video games with a virtual and dynamic structure creates the perception of space.

As study where video games where analysed using urban analysis parameters was conducted as fieldwork. The fieldwork took place in three stages. In the first stage, the games to be analysed were chosen. In this stage, video games including elements of urban environments were reviewed. The samples to be analysed were determined based on their inclusion of urban elements, conduciveness to experience, incorporation of spatial references, ability for the users to experience movement in different scales and the inclusion of elements based on cognitive maps and urban code in addition to visual elements. In keeping with these criteria, samples allowing for free movement and spatial experience were chosen.

In the second stage, video games including different urban construction approaches were analysed using parameters which define urban perception. Lynch, Norberg-Schulz and Lefebvre's urban – spatial analysis theories were used to determine the parameters.

The third stage is analysis. The process of analysis was made in two steps. In the first step, selected video games were analysed based on elements relating to maps, while in the second stage they were analysed

based on visual elements or imagery relating to urban environments. Using these two steps, the study aimed to determine human perception of cities in both short-term and experiential long-term memory via the relationship between cognitive maps and real environments. Accordingly, all three samples were analysed in the order outlined below.

Picture 2 GTA city views

3.1. Analysis of Sample Game Including Urban Environments Reconstructed Based on Real Cities

This game takes place in the State of San Andreas, modelled after Southern California. San Andreas is made of the city of Los Santos, based largely on Los Angeles and an updated version of the city present in "GTA San Andreas", and extensive rural areas. Users are able to roam freely in the Los Angeles-based city and get involved in illicit activities and crime. The fundamental architectural properties of Los Angeles played a major part in the reconstruction of the virtual city. The player is unable to enter the vast majority of buildings surrounding him but does not need to do so either. The city is an area in which the

player can wander around freely. Options for interactivity are numerous; people speak on their phones, yell out and get angry at the player if they are shouldered.

GTA Series uses the city as a metaphor and limits the player to public environments, including all American icons but simply utiziling them as a backdrop and barring the player from entry, though the game is not intended to be a simulation of walking across the streets of Los Santos. The game also includes demographic
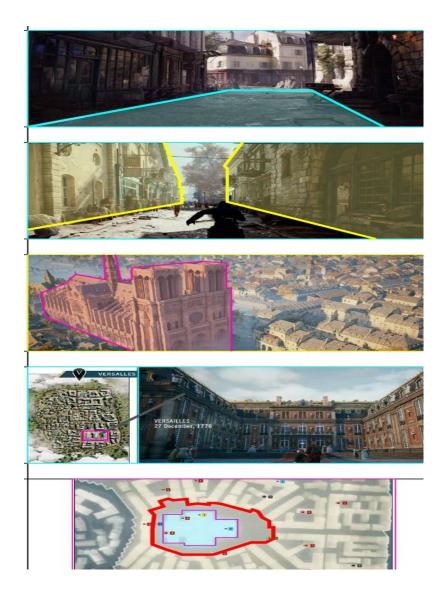
data, one of the most important pieces in our perception of the city. In short, the game as a whole provides a representation of communality which the player can experience unhindered and can be considered one of the games that best describe an urban environment through the lens of public perception. All parameters set by Lynch, Norberg-Schulz and Lefebvre can easily be read in the game. The roads which observers are accustomed to act as the environment in which the game takes place, buildings provide for boundaries, intersections where roads converge are used as central nodes of activity and the player is easily able to pick up the districts which are intended to be the main message of the game, based on how their residents walk or what they wear and even their reactions in the game. As the game was created based on contemporary Los Angeles, it includes all cornerstones of the city. The game map makes it impossible or the player to be lost in the city. [8].

The urban environment present in the game allows for momentary feelings to appear on the player's part and includes the motion and metaphors allowing for their interpretation. For example, the player could at first use her short-term memory to remember an intersection in the game. The next time she passes through, she would recognize the intersection and in time, would generalize her knowledge for similar intersections and eventually adapts to them. Throughout the time a player spends playing the game, further metaphors would spring up in her mind and become established. In time, the player would begin to perceive and even live in the virtual space instead of simply conceiving it. The player could even use the adaptations gained from the game in real life, since the sampled game includes the reflection of a real city.

3.2. Analysis of Sample Game Created Using Historical Elements and Contexts

This game takes place between the years of 1789 and 1799 in Paris, and takes the French Revolution as its subject. It is possible to explore the city, enter through open windows and doors and walk on the rooftops. The city allows us to read information regarding the socioeconomical and cultural status of Late 18th Century Paris.

The player begins determining her position in the video game environment from the moment of leaving her initial position and throughout her journey, roads guide the player to her goal. The roads are representative of the historical era which the game takes place in, being different from contemporary roads in both material and texture. The player sees the roads and travels through them throughout the game's plot, experiencing the historical atmosphere. Her perception is shaped by the roads and in due time, the player gets used to them. Eventually, she starts living within the game and the roads become an element of the outcome of her learning.

Picture 3 ACU city views

As the game is based on the historical layouts of Paris, it includes everything necessary for a city to exist, allowing for the necessary parameters to easily be read. The storyline allows players to witness historical events and locations, and the lived space of the era can easily be read.
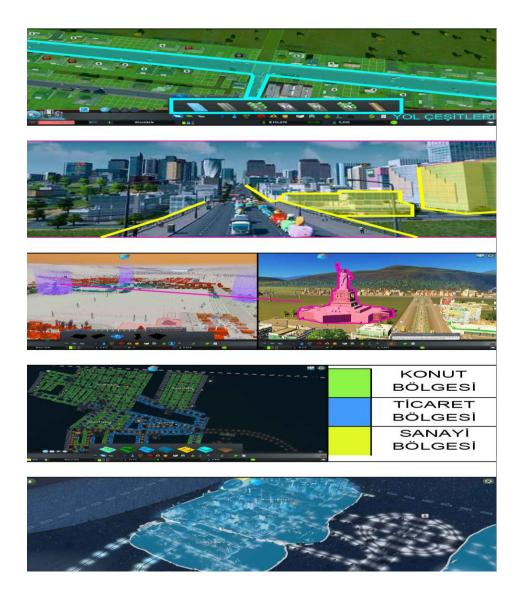
When moving from personal memory to communal memory, the first point of interest to us is culture and the remnants of our culture form our historical environment. In the real world, historical cityscapes are environments providing a glimpse of the social, cultural and economic make-ups; philosophies and senses of aesthetics pertaining to past civilizations.

In virtual spaces where a historical environment is recreated, it is also possible to observe the cultural fabric of a society and reach out to them personally in addition to observing their physical artifacts, as these environments are an aspect of human culture.

The in-game city appears deeply entangled with the French Revolution which affected all nations across the globe. Understanding the city which acts as its backdrop play an important role in our observation of this event which we had learned through traditional media sources from the perspective of an in-game avatar. Some parameters of Lynch, Norberg-Schulz and Lefebvre which had previously been chosen as

urban paremeters can be read in the game with roads, intersections and meeting places from the era being easily readable. However, the buildings complementing them can not be counted as boundaries, since the player is able to traverse them.

Since the storyline presents us with a city which we are well-acquainted with, it provides for familiar feelings – just as if it were the player's home. A space with special connotations like this house plays an important role in the formation of memories. Since it also facilitates dreaming, it comprises a metaphorical environment in which Bergsonian time prevails. Thirdly, Bachelard provides for a tangible manifestation of the concept of memory. Our bodies never forget the first home we encounter; its properties are physically ingrained in us. Memory is physically established and in Bachelard, the temporality of memory is also established spatially. Homes are experienced through a person's body and memories. The most primal reson for the selection of this game is that it is able to project an event established in our lives that we are familiar with, and allows us to experience a present city since it is based on a real urban environment. It allows the player to experience historical Paris, creates memories of it and provides a wholly different kind of immersion by putting the player in the midst of the French Revolution which could only be read about or seen beforehand.

Picture 3 SKYLİNES city views

4. CONCLUSION

Thanks to the rapid development of technologies such as simulation modelling, virtual reality and the internet; users are able to explore the internal structures of buildings, walk on top of them and manipulate internal and external environments. This rapid development of game technologies also creates immense potential for use in urban planning and design, as people are able to transmit knowledge acquired in virtual environments to the real world and vice versa using the medium of video games. Architecture depends on the accretion of knowledge and while we focus on assessing the potential of the data we have at hand when looking to design the neighbourhoods of the future, there is useful data everywhere. Modern environments are affected and driven by both apparent and hidden data and this study has aimed to show that video games which we have all witnessed being played even if we haven't played them ourselves contain a sizeable amount of hidden data in their backgrounds.

In light of our practice, investigations have been made regarding the applicability of architectural knowledge used in operating real environments in constructing virtual buildings with similar functions and charts have been prepared using the results of these investigations. These charts and the conclusions reached from them can be seen below.

Table 2 Table of interests

VIDEO GAMES / PARAMETERS	TABLE OF INTERESTS		
	ANALYSIS OF SAMPLE GAME INCLUDING URBAN ENVIRONMENTS RECONSTRUCTED BASED ON REAL CITIES	ANALYSIS OF SAMPLE GAME CREATED USING HISTORICAL ELEMENTS AND CONTEXTS	ANALYSIS OF SAMPLE GAME INCLUDING PLAYER-MADE URBAN ENVIRONMENTS
PATHS, ENDURANCE	Ongoing channels which the players are accustomed to, remember, generalize and use on a continuous basis.	Ongoing channels in which players can interact with a city that they know in an unknown time period which on a continuous basis with occasional interruptions	Ongoing channels which allow players to re-interpret the paths extant in their memory using the tools available to them on a continuous basis.
LANDMARKS, APPROACH, SYNCHRONISM	Situations allowing a player to perceive the differences and differentiations in special organization	Points in which players imagine and realize environments they had previously seen or visited in some fashion.	Points in which players could, if they wished to, project a reference point in their minds to the game but were not forced to do so.
DISTRICTS, RELATIONSHIPS	Areas that share distinct common characteristics	Areas that share distinct common characteristics which the player recognized during play.	Areas which the player recognized during play and framed using previous knowledge of the past that share distinct common characteristics.
EDGES, AREAS	Linear elements that can not be used as roads or entered by the player which break continuity.	Elements that can not be used as roads by the player but which the player can enter or even ignore that don't break continuity.	Linear elements which can not be used as roads or entered by the player and break continuity but do not constitute boundaries as the player does not use a city-view in the game.
NODES, CENTRALIZATION	Intersection-Direction points of roads for the player or moments where the player transfers between buildings. Intersections between roads serving as points of convergence for the player.	Landmarks or Squares serving as points of intersection/direction for the player. Points such as road junctions or urban infrastructure serving to redirect the player between areas.	Landmarks or Squares serving as points of intersection/direction for the player. Points such as road junctions or urban infrastructure serving to redirect the player between areas.

This chart shows how video games, thought to exist in conceived space are not limited to it and hold the parameters of real space. This appears as a concrete example of how conceived, perceived and lived spaces in Lefevbre's interpretation of space transform into each other when concepts of time and space are broken through the motion present in the game.

Table 3 Space Charts

Attempts at reading environments re-created in game space using architectural doctrine were made during Fieldwork. However, trying to read the spatial properties of games only through architectural doctrine would be half-hearted at best, since environments built in-game are merely intended to be played through whereas real environments as built for utilitarian purposes. Structures present in game are not virtual copies of real buildings, rather real buildings are representative vehicles for gameplay. However, games allow us to experience space and time which we would normally be unable to, even if this is not the main goal of their developers.

A suggestion made by this thesis is that game-related parameters should be included in addition to real world parameters when reading virtual spaces, as parameters provided to us by the real world are insufficient in reading in-game cities. A suggestions in this regard has been provided below.
There is a sense of direction in in-game cities. A person can define her movements and determine her position within the environment. Boundaries such as beaches, railroads or walls can be read in the in-game cities. The player determines her relations with the city using an avatar and is able to manipulate the game but is ineffective against the city itself. Game includes a storyline and the hero who is normally confined to the outer bounds of the city is able to enter buildings and inform future generations regarding the era which the game represents. An avatar represents the Player in-game. Yet at this stage, the player has no effect on the formation of the urban environment. The player can only change the city as far as the game allows it or not at all.

CONFLICT OF INTEREST

No conflict of interest was declared by the authors..

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