

Digital City: The Real Time Simulation of Master Plans Based on The Game World of Warcraft

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Abstract: Facing a global crisis of over-population in cities, architects and urban planners worldwide have been working on master plans for cities created completely anew. While these master plans are skilled and well thought-out, they lack direct contact between the possible inhabitants and the built environment. The city of Masdar, although well thought out in theory, today remains a ghost town, poorly populated. There is an overall need for testing the quality of master plans ahead of building them.

The digitalization of the new era opens the possibility of exploring cities through the digital world, giving valuable insight into their structure and functionality. Checking the functionality of the city can be achieved through real-time simulation of a city in a game. The game analysed is the game *World of Warcraft* - one of the oldest, largest and widely-known games in the industry. While the overall narrative and lore of the digital world provide hours and hours of entertainment, a large portion of the community strives on the possibility of socialization and exploration as the game runs on real-time (concerning character speed, transport speed, the distance between cities etc.). Being able to easily stray from the main storyline allows the players to recreate and readapt their surroundings to their own needs and use all urban facilities. For instance, unplanned (and non-designed) social hubs and points of gathering have been known to show up on the map.

This paper analyses the capital cities in the World of Warcraft through the study of the urban plan, as well as the satisfaction of the players within the city's layout based on in-game performance in terms of social gatherings and events. It compares the master plan of a newly built city and the way it functions in reality, to the functionality and general position of the master plan of the World of Warcraft's specially designed digital city. The analysis provides insight into whether the digital city provides a higher quality city plan and if it is possible to digitally simulate master plans in order to test their quality.

Keywords: digitalization; digital city; town planning; simulation of a city; World of Warcraft

1 Digitalization and the city

The technological advancement of the new millennium has made a tremendous impact on the everyday life of common citizens. The extensive use of ICT networks, the development of virtual platforms for communication as well as virtual space have marked the transfer of humankind from the industrial era to the digital era. Zonghao Bao and Xiang Kun say that *the ethical culture of digital globalization has provided not only a new space for cultural exchange and integration among nations but also a new environment for the formation of new global ethical principles and concepts.* (Bao & Xiang, 2006)

The role of digitalization in forming new social environments can be seen through the shaping of digital space. The creation of digital space has erased the obstacles in communication by means of an interactive platform with direct interference from its user. The combined knowledge achieved through the interaction of different nations, cities and people allows for the network space to become an ideal and realistic space for real-time participation and development in all fields of human study. (Bao & Xiang, 2006) Real-time participation allows building of global ethics by redefining global values and creating models of desirable behaviour in society. One of the key roles of digitalization, analysed in this paper, lies in its possibility of creating real-time platforms for conducting potential scenarios in which human behaviour (as a reaction to the environment) can be studied.

Digitalization and the massive spread of informational systems have had a large impact on the functionality of cities, leading to significant changes in their roles. The newly established roles of urban areas, as central nodes of communication, data transfer and problem-solving, have given them new spatial features and have helped conceptualise *the cities of tomorrow* – green, digital and sustainable utopias. *The smart city, the circular city and the green city* are just some of the many theoretical approaches to the future of urbanization and urban planning. This study analyses the spatial features of several digital cities in the widely-known online multiplayer game, played in real time - *World of Warcraft*. Basic principles upon which the cities were created are established and the idea of how the city functions is compared to how it is actually being used by the players. The master plan of the virtual cities, with its key components, is then compared to cities that have been built since the beginning of the 21st century, based on the contemporary conceptualisation of a city. With the comparison of the principles of the built cities of tomorrow with their real-time functionality (until today), it is pointed out that several issues are re-appearing in different contemporary concepts of the city.

The digital city of World of Warcraft is observed as a platform for discovering and resolving these issues. With the feedback provided from players in real time, who have had experience with playing in different realms and have established what is most important to them in a city, could the in-game platform become a method for testing future master plans?

2 Cities and master plans in the 21st century

The shift in the established set of values and behavioural norms, known throughout the industrial era, has changed in the new millennium. The majority of the human population has moved from rural to urban areas, making cities the key sites of social experimentation and problem-solving. Changes in global paradigms have led to new conceptualisations of cities, emphasizing their role in solving global issues. This has resulted in a range of different spatial solutions based upon new concepts and visions of a contemporary city.

2.1 New Songdo City

New Songdo City is a city designed around one thing: the people who will live and work here. People who will experience an unparalleled Quality of Life as technology, resources and innovation all come together to create the ideal environment. (Gale International, 2006)

One of the most significant and widely-known concepts is the *smart city* concept – an idea in which as the means to rationalise the planning and management of cities seeks to apply massive amount of digital data collected about society. The concept of the *smart city* was implemented in practice in the form of the city of Songdo, in North Korea. In the wake of the financial crisis in Asia, Songdo was to become the first smart city in Asia, and an aerotropolis – a city built around an airport. In order to tackle the financial crisis, the city served as a way to open Korea to foreign investors and try to break the grip of local commerce. The creation of Songdo launched several high-tech projects of cities and city districts spreading throughout Asia. Mega-scale projects such as the development of Songdo offer an opportunity for the modern real estate industry. Due to their size, these projects take years to develop and have a greater opportunity for developing strategies, plans and designs throughout multiple years. Relying on the decision of the developer, mega-scale projects can either proceed, be delayed or be abandoned. Either way, an optimal value for the project can be achieved.



Figure 1 New Songdo City

The plan for (New)Songdo city, as a new international centre of business, determined the following uses: office mixed-use, retail mixed-use, residential mixed-use, residential blocks, private schools, public schools, cultural center, convention center, hotel, government center, hospital, park and golf course. While uses such as open spaces were not enlisted, John Hynes, one of Songdo's developers, highlighted the importance of parks and other recreational areas as a method of increasing the quality of life. In order to create an ideal city, urban planners decided to blend aspects of international cities. Two reasons were behind this decision – the first one being able to have a grasp on the crucial aspects of scale, proportion, configuration and density. The other was providing the city with a heterogeneous structure and making it feel as it has evolved over many decades.

As the city was envisioned with the highest possible quality of life, lower rents, tax benefits and other incentives were provided for the residents and workers. This high standard was envisioned in order to create an

environment unparalleled to anywhere else in Korea, possibly the world, so that companies would choose to relocate to New Songdo City.

Today, amongst the largest private real-estate developments in the world, Songdo is a symbol of South Korea's commitment to sustainable growth and technology. Underground tubes carry trash straight to a central waste facility. Buildings are sensor-equipped and interact with their residents. Subways, buses and a vast bicycle network make the basis of the infrastructure, as Songdo strives to eliminate the usage of cars. Around 40% of the land is dedicated to green space and different mechanisms for recycling rainfall can be found throughout the city.

While Songdo's original goal was to have 300.000 residents, to this day, only 130.000 citizens have populated the city. While a significant number of people live in the area, they have very little contact with each other, rendering the city invisible. Wide avenues and a sprawling scale create a rift between human activities. While the city does deliver its promise of a technological utopia, it remains under-populated and practically a ghost town.

2.2 Masdar City

Throughout the 21st century, there has been an increased level of awareness and public concern on the matter of rapid urbanisation. Fear has been spread worldwide as the connection between urbanisation and increasing environmental despoliation has become apparent. Cities, generators of urban development, have been recognised as the root of the crisis. Green capitalism, green neoliberalism and green economy have generated a series of urban and economic interventions throughout the world, justified as a necessary course of action in fear of a global crisis. (Caprotti, 2014)

The idea for the Eco-city, a result of a global trend in sustainable and green large-scale projects, revolved around the concept of creating zero-carbon cities with no environmental footprint. The main key point indicator is the proportion of renewable energy in total energy consumption, hoping to reach a staggering 100% in newly built planned cities. (Evans, 2011) While the terms eco-cities and low-carbon cities are not identical in meaning, they are often used interchangeably, referring to the same city. In 2010, after being enlisted as having the highest environmental footprint per capita in the world by the biennial Living Planet Report (for the third time in a row), the United Arab Emirates launched a series of high-profile green projects. One of these projects was a plan for a zero carbon eco-city known as Masdar.

An emerging clean technology city, located in Abu Dhabi, Masdar has been planned and designed to ensure the most efficient use of resources, while maintaining a high quality of life. All sources of energy are renewable, focusing mainly on water and solar power and all buildings are automated.



Figure 2 Masdar City

The Technology Roadmap strategy and Vision for the city, as of 2009, focuses on two main aspects: (1) Masdar city as a customer and user-end of technology that is procured, implemented and operated over a wide range of clean technology solutions for buildings, infrastructure and operations to achieve revised sustainability goals and 2010 development key point indicators (KPIs) and (2) Masdar City as a platform for technological development

that generates revenues by giving strategic partner companies the space to develop and test new technologies. (Geroe, 2017)

The strategy focuses on creating a technological utopia, with clean and renewable energy, perceiving residents as the users of the provided technological solutions, instead of a group of permanent residents which have their own needs in terms of functionality inside the city. While the project has been praised for its ecological solutions, it has also been widely criticised, being a 'luxury project for the rich, financed by oil dollars'. New York Times architectural critic Nicolai Ouroussoff has called it "the ultimate gated community". The elitism of the planned cities often is a problem when trying to populate them, as the new cities are, currently, mainly for the wealthy. When the project was initiated in 2006, Masdar anticipated 50.000 new residents within a decade, in 2014 this number was closer to 1300 – mostly being students at Khalifa University of Science and Technology (formerly the Masdar Institute) and living in on-campus hosting. Rather than 50,000 residents by 2018, which was one of the main goals, the current numbers indicate a new goal which is 3,500 residents by the year 2020. The city's focus has been shifted from becoming a residential area, to a business and a way of gaining profit, making the city, as in the case of Songdo, practically a ghost town.

Besides Songdo and Masdar, several other eco and smart cities and large-scale projects remain under-populated to this day. While they are designed by widely-known international offices, the results are surprisingly mundane, which seems to be an issue with almost all contemporary planned cities (Keeton, 2015). While the public services they provide are reliable and innovative, the built environment they create is universally stifling and generic, lacking the appeal of historic cities. Skyscrapers, glass buildings, corporate franchise and wide avenues look like they could have been found anywhere in the world as if the last century of innovation in urban planning has had no influence in the creation of the master plan. The focus on technological innovation has left the users of the space as a minor nuisance, instead of the main reason for creating a new city.

3 Designing the cities of World of Warcraft

Digitalization has provided the world with a platform for endless creation, without taking up physical space. The possibility of establishing a connection with other people without having to leave your residence (home) has completely changed the way people perceive and utilize methods of communication. The controlled online environment allowed the developers to test new ideas and adapt their needs to the needs of users. This level of flexibility and adaptability renders the digital environment sustainable in the sense that it can be re-arranged at any possible point in time and adapted to newly found needs.

The World of Warcraft, or commonly known as WoW, (Blizzard Entertainment, 2004) is a massively played online role-playing game (MMORPG). Creating the world in WoW focused on a mix between an open-world (players do not have to stick to the pre-determined storyline) experience with a rich background story of a fantasy universe. The user experience (UX) is heightened by the game's highly adaptable user interface (UI) and the spatial nature of the game itself. This spatiality is what differs videogames from other media such as television and film. Aarseth claims that "the defining element in computer games is spatiality".

Following the general principle in which architecture is a method of organising and using space, looking at the architecture in videogames is a way of looking at how to use space. The architecture in videogames does not need to be based on rationality, leaving more room for experimentation and making the digital city a good platform for testing a city plan. The developers followed several key-point principles which re-appear throughout different cities modelled in the game.

This paper focuses on the analysis of the key architectural and urban principles in designing capital cities in the game, as these cities are the main points for gatherings and exchange between players. Each of the capital cities belongs to either one of two fractions/opposing sides (Alliance and Horde) and to a certain species. The lore behind the ever-lasting war between the fractions, and the story coming from the species itself, highly influences the spatial model and general appeal atmosphere of the city itself. The storyline is integrated into every segment of the world, making it a crucial aspect of the general spatial organisation and ambience.



Figure 3 Map of Undercity

The players have shown to choose some cities, or meeting points over others. Capital cities, which can be expected, are the places with the richest lore, the biggest number of facilities (including vendors, banks, auction houses, guilds etc.) and have the best connection with all corners of the world. As World of Warcraft is a real-time game, travelling long distances by (character) foot can be difficult and take several hours. The position of portals and flight masters (airports) in the game can be crucial for playing the game efficiently and saving a lot of time on needless running. It is no surprise then that the positioning of capital cities on the map, is of great value to the players and shows that good connection is a value both in-game and in the real world.

Besides good connection with other parts of the map, the capital cities, such as Undercity, provide the largest amount of different points of interest in a smaller area. Undercity, the underworld capital city of the Undead faction, is organised in a circular plan where activity points (interaction between players and non-playable characters, as well as interaction in between players) are located in a ring-like manner. The center node is the main meeting point. The first zone, a ring around the center, provides with vendors and most commonly visited points of interest. The second zone, a larger ring around the first one, provides specific activities that are not so frequently visited (such as auction houses or guilds). The organisation is similar to any plan of a circular city in real-life, scaled down for the needs of the game. As residential areas do not exist in the game, the 'spawn point' (entrance to the city or the flight master) can be perceived as the 'residential' point from which all zones are easily accessible by using bridges in between the rings of activities.

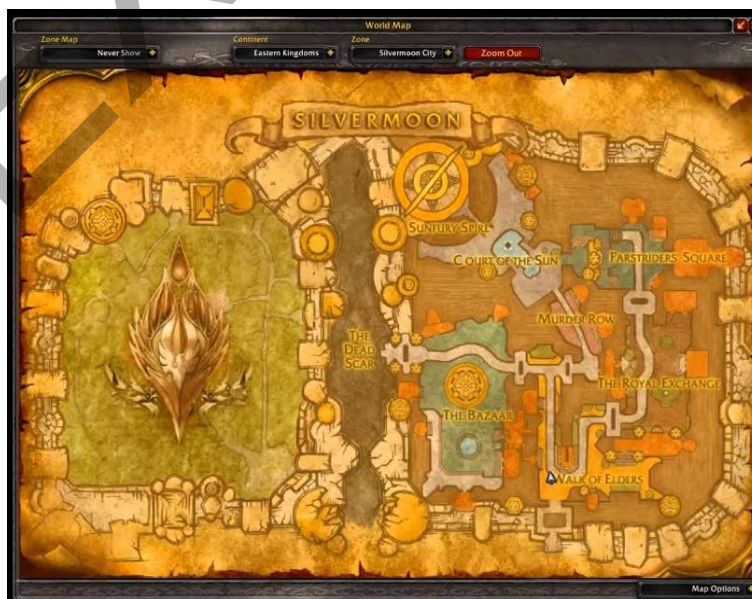


Figure 4 The map of Silvermoon city

Some of the key aspects when designing the city were based on the quality of in-game user experience. Silvermoon city, one of the capitals added after the initial setup of the game in 2004, was based on user experience from other (existing and playable) capital cities:

One key lesson learned from the current cities is that many players tend to gather around a few points of interest: mailboxes, auction houses, banks, flight paths, and inns. This can result in a noticeable slowdown for those entering one of these hotspots; and falling into the infamous trench in Ironforge has been the unfortunate fate of many a hero. The way the dev team approached this challenge while designing Silvermoon was to spread out the traditional crowd magnets. Silvermoon City features two auction houses, two banks, two inns, and eleven mailboxes. Also, the flight master resides outside the city, so new arrivals won't be dropped into a huge crowd of players upon their arrival. (Official WoW website, 2019)

Overall, several key principles are in the developers focus when they position, model and create the WoW cities:

- A new city has to be an extension of the existing storyline and lore in terms of ambience and design, creating a unique identity for each city;
- A new city, based on user experience, has a network of crowd magnets which appeal to the general audience;
- A new city has to have a good connection with the existing world. Its position on the map is a crucial indicator of how many players will be visiting it.

At the base of all principles lies customer (player) satisfaction, proving with each expansion and the ever-growing community to be fulfilled.

4 The city as an experiment

'As a field site, the city exhibits a specific reality that is found, and that possesses an incontestable, singular truth by virtue of its lived materiality. In contrast, the city as lab becomes the cypher for any city, interchangeable and controllable through the manipulation of variables, possessing a truth borne of replicability' (Evans 2011:226).

The focus on the city as an experimental location for testing new technologies, architectural and urbanistic solutions, and environmental-economic reforms is linked to the quasi-utopian approach viewing the city as a laboratory, as an empty and bounded container. (Caprotti, 2014) Eco and smart cities therefore as regarded as a 'technological fix' based around *the desirability for a transition to green capitalism and the need to rework the city so that it becomes adaptable to environmental externalities caused by earlier (industrial, fossil fuel-based) iterations of capitalism.*

The approach to the city as an experimental site allows for the city to strive and prosper in an economic and environmental aspect, leaving the socio-cultural discourse to chance. Planned cities often have trouble adapting to changing circumstances as their design doesn't provide them with the needed flexibility and variety that can be found in historic cities. (Hartman et al., 2010) As technology is always developing, and smart and eco-cities are built from scratch on the technology available at this time, the question is whether these cities will be able to adapt to future technological advancements.

Creating the digital city in World of Warcraft revolves around the community and its needs. The user experience is a mixture of experiencing the storyline through interactive gameplay, having a simple and adaptable user interface and being invested in the world with its unique atmosphere and ambience. Although the digital city is more controlled, flexible and adaptable than the built city, making it a better polygon for experimenting, the developers' focus is primarily on user experience, putting the players and their needs as the top priority.

Although this is to be expected, as the video game earns profit from its players and the likelihood of their commitment to playing the game, when the same principles are applied to a large-scale project, the analogy becomes apparent. With user satisfaction (citizens/residents in the real-life city), there will be a bigger profit due to more players continuing their experience or joining the community (establishing permanent residence in a new city).

5 Conclusion: what can we learn from the digital city?

The new cities of the 21st century tend to fall into the same, generic solution for what a contemporary city should look like. Driven by digitalization and technological progress, the need for profit and personal gain and keeping ahead on the market, master plans for eco or smart cities share similar characteristics and have the same results in terms of usage and the on-going trend of technological ghost-towns. They have a hard time coping with changes, have no pre-formed identity (which attracts new residents) and are often extremely dependent on one particular system which works in a specific climate or cultural setting, often not being achieved in a real-life scenario (for instance, for Masdar to reach its full potential, it would require 50.000 citizens in order to function which, to this day, has not been proved possible). These cities, instead of becoming a utopia of healthy living and

the world of tomorrow, become symbols of business and commerce, leaving them unpopulated and, subsequently, non-sustainable.

Profit is essentially a large motivator for every project. It is, however, not mutually exclusive to user satisfaction and quality experience. Focusing on user satisfaction while providing quality spatial solutions (as an important point in the overall gaming experience) allowed the digital cities of World of Warcraft to create a devoted fanbase which continues to grow, gaining profit in the process.

Putting the user and his needs as the base of the design process shaped the space of the digital world so that it provides quick and efficient methods of transport, a network of active meeting points and a general appeal and firmly shaped identity. The digital platform, with its ability to quickly adapt and re-arrange the world when collecting user feedback, can become a test-drive for building a planned city in the real world. The principles of designing cities in WoW are universal and can be integrated within a city master plan. The devoted fanbase of the game can serve as real-time users of the space, giving quality feedback to the design team and providing valuable information on the actual functionality of the plan.

As the world is searching for sustainable spatial solutions, it tends to find the answer for all its problems in technology, instead of taking into account what it has learned about spatial and urban planning throughout its history. While technology does provide much-desired innovation, it tends to create a closed frame for architecture and urban planning, peering on the idea that only by building smart buildings, fully automated or alternative methods of transportation can a quality solution be achieved.

The existence of online, digital cities such as WoW lets us experiment with space and design to the fullest extent and allows architects and urban planners to learn from this experience. Even though based on technology, the digital city has a more human-scale approach to design than many newly built, planned cities. Human-scale is crucial for achieving a good quality of life in a city. Creating a model of the city in digital form allows the users (future residents) to shape the space to their needs, achieving a high level of participation and communication between the urban planners and the stakeholders, mainly the future residents.

By allowing the citizens to take part in the design process, they are able to fully endorse their right to the city through the lens of the digital city, creating an undeniable synergy between technology, space and people.

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References

- Bao, Z. and Xiang, K. (2006) ‘Digitalization and global ethics’, *Ethics and Information Technology*, 8(1), pp. 41–47. doi:10.1007/s10676-006-9101-7.
- Caprotti, F. (2014) ‘Eco-urbanism and the Eco-city, or, denying the right to the city?’, *Antipode*, 46(5), pp. 1285–1303. doi:10.1111/anti.12087.
- Evans, J.P. (2011) ‘Resilience, ecology and adaptation in the Experimental City’, *Transactions of the Institute of British Geographers*, 36(2), pp. 223–237. doi:10.1111/j.1475-5661.2010.00420.x.
- Geroe, S.J.W. (2017) ‘The Sino-singapore tianjin eco-city: A case study of chinese experimental regulatory and institutional development’, *International Journal of Sustainable Development and Planning*, 12(06), pp. 987–994. doi:10.2495/sdp-v12-n6-987-994.
- Hartman, M., Knell, M.B. and Witherspoon, J. (2010) ‘Masdar City’s integrated approach to sustainability’, *Proceedings of the Water Environment Federation*, 2010(2), pp. 104–117. doi:10.2175/193864710798285516.