

Smart and Connected: Esports Centers as Urban Social Hubs for Smart Cities

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Abstrak

Amidst the swift progression of technology and the rising demand for interactive urban spaces, esports centers have emerged as promising platforms for actualizing the vision of smart cities and communities. This research investigates how the spatial design of esports centers can effectively integrate smart city principles and strengthen community bonds within urban environments. Through an innovative design approach, this study conceptualizes esports centers as multifunctional spaces beyond gaming arenas. By leveraging information technology, smart lighting, and eco-friendly materials, these centers are designed to provide an inviting and comfortable environment for visitors. The incorporation of digital connectivity, social spaces, and sustainability zones into the interior design aims to ensure an immersive gaming experience while encouraging social interaction. The findings of this research demonstrate that designing esports center spaces in alignment with smart city concepts can create environments that support gaming activities and foster collaboration and interaction among visitors. Therefore, this research offers a new perspective on the potential of esports centers as integral components of smart cities, emphasizing the crucial role of spatial design in developing connected and sustainable communities

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1. Introduction

Esports is a term that refers to competitive video gaming, usually involving professional players, teams, leagues, tournaments, and spectators. Esports is a growing phenomenon that attracts millions of fans and generates billions of dollars in revenue worldwide. Esports can be considered a sport because it involves physical and mental skills, rules, strategy, and competition [1]. The social and cultural benefits of esports are evident, leading to the development of an active community and improved players' mental and emotional capabilities [2].

A smart city is an urban setting that employs information and communication technology (ICT) to enhance the effectiveness, sustainability, and overall well-being of city services and systems [3]. Smart cities also aim to foster social inclusion, participation and cohesion among city residents by creating opportunities for interaction, collaboration and co-creation. However, smart cities often face challenges in engaging residents and fostering a sense of community, especially in large and diverse urban areas. Therefore, innovative and creative approaches are needed to design smart urban spaces that can foster social interaction and generate social capital [4].

Formosa et al. (2022) characterized an esports center as a "physical scene where people can assemble to lock in in competitive video gaming[5]". Concurring to Scholz (2019), an esports center is portrayed as "a area where people can take an interest in competitive video gaming, whether it be online or offline, whereas too having the opportunity to associated with individual gamers and onlookers[6]". Peng et al. (2020) characterized an esports center as a "office that serves as a have for esports competitions, advertising gaming conveniences and administrations for both esports devotees and players[7]".

An esports center is a physical venue that provides facilities and equipment for esports activities, such as game consoles, computers, screens, and sound systems. Esports centers may also offer other services and amenities, such as food and beverages, merchandise, training, and education. Esports centers can be considered a new type of urban media architecture: a built environment that integrates digital media and technology into spatial design and functionality.

This research aims to find out how an esports center can be part of a smart city and improve community engagement. The research will conceptualize the design of an attractive and comfortable esports center, assess its impact on visitor experience and well-being, and provide suggestions for further development.

2. Methodology

Qualitative methods are a way to research and understand the phenomena that are the main focus of research by respecting participants as experienced and knowledgeable subjects, not as passive and silent objects [8]. The way to determine the architectural design according to the theme as an approach to this project was chosen based on several considerations, including:

1. Issues related to the design objects

The conception of the esports center was driven by the growing demand for facilities catering to esports activities. This necessity was qualitatively explored through data derived from relevant journals and books, examining the unique requirements and considerations associated with esports centers.

2. Issue identification

Based on insights gained from esports center needs research, specific design challenges and considerations were identified.

This smart city and community theme is an important reference for determining the best design location and digging deeper into the themes that apply to esports centers.

3. Identify design style by theme

Themes were selected to focus on addressing challenges related to promoting and improving esports activities and consistent with the context of smart cities and communities. This decision was influenced by the need for technology and space that could meet all of the community's needs related to esports events and activities.

3. Finding and Discussion

Smart city as the concept of development, application, and implementation of technology used in an area as a complex interaction between various systems contained therein [9]. This smart city concept carries 6 indicators including :Smart Economy, Smart People, Smart Governance, Smart Mobility, Smart Environment, and Smart Living. A smart community is a community that encompasses various levels, from local to national, that has a common goal where members, organizations and authorized agencies work in collaboration to utilize information and communication technology to make meaningful changes [10]. With these indicators, the esports that will be conceptualized should achieve the entire scope of these indicators so that the esports building can contribute to building a smart city and community.

Through various considerations, the selection of materials in buildings is also very important, because the wrong choice of materials can have a negative effect on the surrounding environment. Conversely, if it is right in choosing materials, especially environmentally friendly materials, it will provide good benefits for the surrounding environment such as:

1. Saving natural resources,

2. Reduce carbon footprint,
3. Improve air quality,
4. Reduce construction waste, and
5. Improve energy efficiency

Chandra and Dwi (2021) state that environmentally friendly materials offer convenience in construction or assembly, as they have more elastic and portable characteristics, and can save natural resources, reduce waste, increase energy efficiency, and improve air quality. by using environmentally friendly materials can also realize one of the indicators, namely smart environment contained in smart city indicators. this provides positive things for visitors and also the surrounding environment.

Green Open Space

Green open spaces can improve the physical and psychological conditions of the community, as they provide comfort, aesthetics, and collective spaces for communication that strengthen the social relations of city residents [11]. Green open space is one of the good options in realizing a smart city. this open space concept will be provided within the esports land, where this space will offer various things that can be done. facilities that will be provided such as areas for socializing, amphitheatres, gazebos, pavilions. educational areas such as reading parks. Enhancing accessibility and comfort through amenities such as well-designed seating, diverse food and beverage options, and convenient restrooms can greatly elevate visitor satisfaction and enrich the overall experience [12].

Lighting

Integrating advanced design elements, including dynamic lighting and sophisticated sound systems, can significantly elevate the visitor experience and establish a distinctive identity for the esports center [13]-[15]. the lighting concept that will be carried out in this esports building maximizes natural lighting in public spaces. then in the athlete's special room, using lighting that gives a comfortable and warm impression. and in some rooms it is also modified using rgb lighting which interprets the modern impression of the esports building.

Material

selection of the right materials to create a good atmosphere in the esports building. the following is the selection of materials that will be used into the esports building.

Table 1 Material of the building.

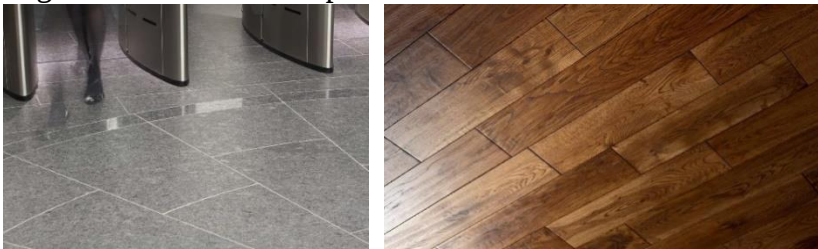
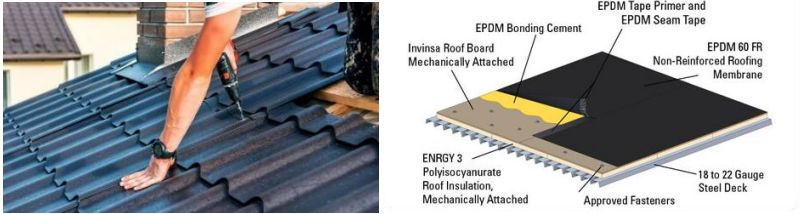
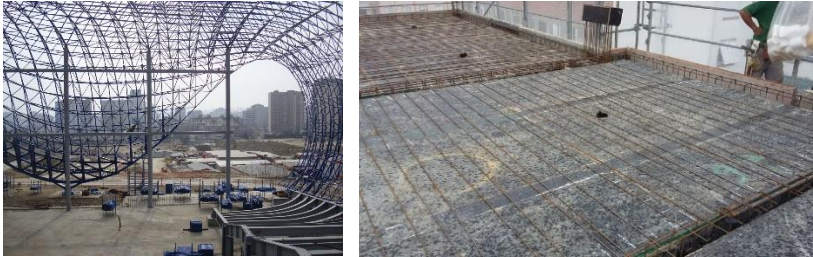
Component	Description
Floor Covering	Floor covering materials can use natural materials such as marble, granite, natural stone etc. can also use wood materials in some rooms to give a more natural impression.  Figure 1 (a) Granite Flooring; (b) Wood Flooring.
Wall	The material used for the wall is precast concrete, because it has some advantages such as faster installation, and reducing construction waste.

	 Figure 2 (a) Concrete Wall ; (b) Glass Wall
Roof	The roofing material chosen is metal roofing, which has the advantage of being resistant to extreme weather, although it has drawbacks such as heavyweight and noisy sound when it rains. In addition, there is also membrane roofing material such as neoprene, EPDM, PVC, and the like. This material is lightweight, has high flexibility, and is corrosion resistant, but also has disadvantages such as being prone to tearing, so it requires regular maintenance.  Figure 3 (a) Metal Roofing ; (b) EPDM Material Roofing
Roof Structure	The materials that will be used in the roof structure include conventional steel, concrete on concrete slabs, and also spaceframing for more complex structures.  Figure 4 (a) Spaceframe Structure Roof ; (b) Concrete Construction Roof

4. Conclusion

This study aims to design an esports building that positively impacts smart cities and communities, focusing on six indicators: Smart Economy, Smart People, Smart Governance, Smart Mobility, Smart Environment, and Smart Living. It also considers environmentally friendly materials, green open spaces, and optimal lighting.

According to the study, esports buildings can improve the quality of life for athletes, spectators, and the neighborhood by fostering socialization, education, and esports. They can also lessen their environmental impact by using energy- and resource-efficient materials and by including green open spaces that are beneficial to both physical and mental health.

This study contributes to the development of science and practice in the fields of

architecture, esports, and smart cities. This study also provides recommendations for stakeholders who are interested in planning, building, and managing esports buildings that can integrate with the concept of a smart city and smart community. Some of the recommendations that can be given are:

1. Conduct a comprehensive feasibility study before starting the esports building project, including market, financial, technical, social, and environmental analysis.
2. Involve stakeholders, such as government, private, academic, esports community, and the general public, in the process of planning, building, and managing esports buildings, to achieve common goals and increase participation and involvement of the community.
3. Adopt environmentally friendly design principles, such as using materials that can be recycled, biodegradable, or renewable, using alternative energy sources, such as solar, wind, or biomass, using natural ventilation and lighting systems, and using energy-saving technology, such as LED, motion sensor, or smart meter.
4. Create a multifunctional green open space, such as an area for socializing, playing, learning, or resting, that can be accessed by all groups, both visitors, athletes, and the surrounding community, and equipped with adequate facilities, such as amphitheater, gazebo, pavilion, or reading park.
5. Conduct regular evaluation and monitoring of the performance and impact of esports buildings, both in terms of economy, society, culture, and environment, and make improvements and enhancements as needed according to the development of the times and the needs of the community.

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References

- [1] Kane D, Spradley B. Recognizing ESports as a Sport [Internet]. The Sport Journal. United States Sports Academy; 2017. Available from: <https://thesportjournal.org/article/recognizing-esports-as-a-sport/>.
- [2] ESPORTS ARENA / CENTER [Internet]. E-BLUE ESPORTS. [cited 2024 Jun 21]. Available from: <https://www.ebluegaming.com/esports-center>.
- [3] TWI. What is a Smart City? – Definition and Examples [Internet]. www.twi-global.com. 2022. Available from: <https://www.twi-global.com/technical-knowledge/faqs/what-is-a-smart-city>
- [4] Smith A. How esports can help cities engage residents and build community [Internet]. American City & County. 2022.
- [5] Formosa J, O'Donnell N, Horton EM, Türkay S, Mandryk RL, Hawks M, et al. Definitions of Esports: A Systematic Review and Thematic Analysis. *Proceedings of the ACM on Human-Computer Interaction*. 2022 Oct 25;6(CHI PLAY):1–45.
- [6] Scholz TM. Deciphering the World of eSports. *International Journal on Media Management* [Internet]. 2020 Apr 21;22(1):1–12.

- [7] Reitman JG, Anderson-Coto MJ, Wu M, Lee JS, Steinkuehler C. Esports Research: A Literature Review. *Games and Culture* [Internet]. 2019 Apr 15;15(1):155541201984089. Available from: <https://journals.sagepub.com/doi/full/10.1177/1555412019840892>
- [8] Raco J. Metode penelitian kualitatif: jenis, karakteristik dan keunggulannya. 2018 Jul 18;
- [9] Ika Widiastuti, Nany Suryawati. Implementation of Smart City Development Policy in Bandung City, Indonesia. *IJEBD (International Journal of Entrepreneurship and Business Development)*. 2021 Jan 9;4(1):91–8.
- [10] Canada. (1998). *Smart Communities: Report on the Panel on Smart Communities*. Ottawa: Industry Canada Panel on Smart Communities.
- [11] Eva Kenny Tambunan, Siahaan U, M. Maria Sudawarni. Pengaruh Ruang Terbuka Hijau Terhadap Psikologis Masyarakat di Kota Bekasi Khususnya Kecamatan Jatiasih. *Arsitektura : jurnal ilmiah arsitektur dan lingkungan binaan/Arsitektura*. 2021 Oct 30;19(2):297–7.
- [12] Apriani K, Yuono D. PUSAT ESPORT JAKARTA. *Jurnal Sains, Teknologi, Urban, Perancangan, Arsitektur (Stupa)*. 2019 Sep 9;1(1):204.
- [13] Okinanta, Y., Tiaga, A., & De Yong, S. (2017). *Perancangan Interior Garena E-Sports Stadium Di Surabaya*. Surabaya: Universitas Kristen Petra.
- [14] Vidi Yudha Sulandra, Amru Siola, Rahmawati Eka. GORONTALO ESPORTS CENTRE DENGAN PENDEKATAN ARSITEKTUR FUTURISTIK. *Jurnal Arsitektur, Sains Bangunan, Kota dan Pemukiman*. 2022 May 1;1(2):41–7.
- [15] Zakaria N. Perancangan Baru Esports Training Center di Bandung. *eProceedings of Art & Design*. 2020 Oct 9;7(2).