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GREEN E-SPORTS BUILDING DESIGN WITH FUTURISTIC PRINCIPLE APPROACH

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Abstract: *Advances in technology have made some activities shift from offline to online. This condition also occurs in sports activities, namely electronic sports (e-sports). The public's enthusiasm for welcoming e-sports is accompanied by the emergence of e-sports teams that have training facilities for players. However, in its implementation, most e-sports training facilities are wasteful in electrical energy consumption. Based on this phenomenon, the author offers the design of an environmentally friendly e-sports training facility by applying a green building nuanced design through an approach to futuristic architectural principles. This research uses architectural design methods to produce an e-sports training facility design with green building nuances. The design of the building site is placed in the middle of the land, to provide undeveloped areas on all sides of the site for green areas to reduce global warming. The façade of the building uses wide glass combined with a curtain wall frame so that natural lighting in the space in the building is more optimal. The placement of line ornaments on the outer side, as secondary skin, reduces the radiance of sunlight in the afternoon. The use of prefabricated materials has advantages in terms of shape, size, and ease of installation. The use of ACP combined with exposed steel frames without repainting is a measure to reduce pollution and a representation of honesty.*

Keyword: *E-sport, Green Building, Futuristic.*

Abstrak: Kemajuan teknologi telah membuat beberapa kegiatan bergeser dari offline ke online. Kondisi ini juga terjadi dalam kegiatan olahraga, yaitu olahraga elektronik (e-sports). Antusiasme masyarakat menyambut e-sports diiringi dengan munculnya tim-tim e-sports yang memiliki fasilitas latihan bagi para pemain. Namun, dalam pelaksanaannya, sebagian besar fasilitas pelatihan e-sports boros konsumsi energi listrik. Berdasarkan fenomena tersebut, penulis menawarkan desain fasilitas pelatihan e-sports yang ramah lingkungan dengan menerapkan desain bernuansa green building melalui pendekatan kaidah arsitektur futuristik. Penelitian ini menggunakan metode perancangan arsitektur untuk menghasilkan perancangan fasilitas pelatihan e-sports yang bernuansa bangunan hijau. Desain bangunan yang ditempatkan di tengah tapak, menyediakan area yang belum diolah di sisi tapak sebagai area hijau untuk mengurangi pemanasan global. Fasad bangunan menggunakan kaca lebar yang dipadukan dengan bingkai dinding tirai sehingga pencahayaan alami pada ruang dalam bangunan lebih optimal. Penempatan ornamen garis di sisi luar, sebagai *secondary skin*, mengurangi pancaran sinar matahari di siang hari. Penggunaan material prefabrikasi memiliki keunggulan dari segi bentuk, ukuran, dan kemudahan pemasangan. Penggunaan ACP yang dikombinasikan dengan rangka baja terbuka tanpa pengecatan ulang adalah langkah untuk mengurangi polusi dan representasi kejujuran.

Kata Kunci: E-sport, Bangunan Hijau, Futuristik

INTRODUCTION

Technological advances make many changes in activities carried out by humans. The transition of activities carried out offline to online has occurred in several sectors, one of which is in the sports industry. With the development of device technology today, a new sport has been created that uses devices as a competition medium, called electronic sport (esports). Esports is categorized as a non-physical sport like chess, it has been competed several times at national and international sports events.

Due to the rapid development and enthusiasm of the community, many parties finally made their own esports teams. Not only that, they also provide training facilities for their players. This aims to revive the competitive scene in the field of esports and make more achievements in the future. But in its implementation, most of these esports training venues tend to consume massive electrical energy, especially in the electricity of the devices and lighting used. Like the training facilities owned by several esports teams that are designed using many colored LED lights and minimal natural lighting in their

spaces. Designing space in this style does give the impression of technological progress, but this can have a bad effect on the environment.

To be able to welcome the development of the esports industry that still minimizes negative impacts on the environment. So, a design was made for an esports training facility design with green building nuances with an approach to futuristic architectural principles. This design includes optimizing natural lighting in space, providing green open space, and selecting materials and building utility systems that support the concept of green building. The design of this facility will be located in South Jakarta City in an area that serves as a designation for education and training activities. This location was chosen because it is easy to reach and quite high esports activities in the surrounding community.

LITERATURE REVIEW

The principle of green building is to reduce energy use in buildings, among these principles is the use of materials that have long-term durability and low maintenance costs. The building construction process is easy, cost-effective, and has a positive impact on the surrounding environment. Selection of power-efficient building utility systems. Consider the use of alternative energy in buildings. And the provision of green open space amounting to 40% of the land area (Setyowati et al., 2013).

Vertical building planning (middle-rise or high-rise) can reduce land use for buildings, leaving more green areas on the land. Building design that applies green building principles not only meets the needs of space and human activities, but also contributes positively to the issue of global warming (Melissa et al., 2023). The building with a futuristic design concept has several characteristics that make it iconic. The first is a form that has philosophical value according to the context of its design and is large-scale or high-scale. Then the strategic location of the site and easy access to achievements. In addition, the sturdiness of the building through fabrication materials, as well as exposing materials and structures (Pratama et al., 2022). In large buildings, it will be very interesting if you apply futuristic principles to the maximum. The application of the principles of futuristic architectural style can be seen from technological sophistication, geometric shapes, placement of wide window fields, and prioritizing the use of exposed materials (Faturrahman & Aqli, 2021).

The use of locally prefabricated building materials can reduce carbon footprint due to insufficient transportation needs. In addition, prefabricated materials can also save cost and time during construction because of their practical installation. (Sharma, 2020).

The balance of environmental, economic, and social aspects must be maintained in the development of Green Building. The provision of green building certificates must also be increased, so that project owners can compete in innovating for green buildings. It aims to increase the benefits of

environmentally friendly buildings in Indonesia (Mardiyana et al., 2023).

RESEARCH METHODS

This research uses architectural design methods to produce an esports training facility design with green building nuances. Starting from data collection, design approach, data analysis, and design synthesis. From this synthesis emerged design concepts that will be applied to building design.

2.1. Data Collection

Data collection was carried out through literature studies using the internet related to reviewing the types of esports matches, the number of players in esports matches, precedent studies of esports team training facilities in various places, and regulations on the selected design land locations.

2.2. Design Approach

The context of esports training that represents the advancement and use of technology is the main identity of the design of this building. In addition, the nuances of green buildings are also implemented to reduce negative impacts on the environment. So the design approach chosen is with futuristic architectural principles that prioritize green building elements.

2.3 Data Analysis

Data analysis begins with functional and spatial analysis that reviews the activities and number of users at similar esports training facilities. So as to produce spaces that are measurable and in accordance with the needs of the building. Followed by contextual analysis on the site that will produce responses to the conditions around the site. Then the analysis of the sheath is related to the façade of the building to be designed. Each analysis will produce a response to the needs of the building in the form of design concepts

2.4. Design synthesis

The synthesis stage will combine all the concepts that have been created and relate them to one another. So that a complex and continuous concept is compiled. This concept will be a reference for researchers in designing this esports training facility.

RESULT AND DISCUSSION

The design concept consists of three parts, namely the concept of site design, architecture, and utility.

1. Site Planning Concept



Figure 1. Block Plan
(Source: Author, 2023)

The building area is placed in the middle of the land, thus providing an undeveloped area on the side of

the site. Vehicle circulation is made a one-way street around the building. The contour of the soil has a height difference to give a natural impression. Undeveloped areas are used as green areas with varied vegetation. Figure 1 provides information on the block plan of e-sports training facilities.

2. Architectural Design Concept

The concept of architectural design is a synthesis of analysis that will be applied in the form of building design, both exterior and interior.

2.1. Use of Glass Material

The façade of the building uses wide glass combined with a curtain wall frame (Figure 2). The use of this glass material aims to optimize natural lighting in spaces in buildings (Figure 3). The placement of line ornaments on the outer side, as secondary skin, reduces the radiance of sunlight in the afternoon.

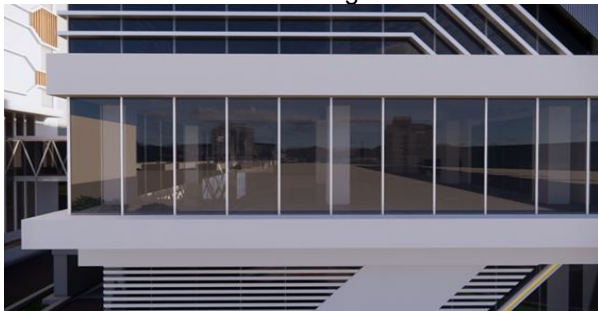


Figure 2. Glass Façade with Curtain Wall Frame (Source: Author, 2023)

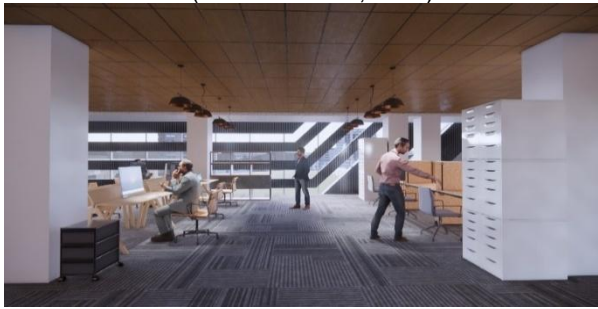


Figure 3. Interior (Source: Author, 2023)

2.2. Use of Prefabricated Materials

Prefabricated materials have the advantages of shape and size so that they can be ordered according to design needs. Material installation is easier because the shape has been adjusted during the production process. The prefabricated material used is an aluminum composite panel (ACP) combined with a steel frame. This ACP material will be exposed without repainting as a measure to reduce pollution and a representation of honesty (Figure 4).



Figure 4. Aluminum Composite Panel Façade (Source: Author, 2023)

2.3. Green Space

In addition to serving to reduce global warming, green space is useful for e-sports players to relax themselves during training. E-sports practices that require players to stare at the screen for a long time, can make the eyes tired. Figure 5 visualizes the players rest their eyes for a moment, by looking at the green trees, before returning to training.



Figure 5. Green Space (Source: Author, 2023)

3. Utility Concept

3.1. Air Conditioning System

Air conditioning systems in buildings generally use Variable Refrigerant Flow (VRF), which is the latest air conditioning technology that can streamline energy use and facilitate room temperature regulation. The use of this system tends to be expensive at the time of installation, but it is more economical in daily use. The VRF unit is placed on the rooftop of the building as seen in figure 6.



Figure 6. VRF Outdoor Units (Source: Author, 2023)

3.2. Alternative Energy Source

The main electricity in this building is sourced from the National Electricity Company (PLN). However, to support the concept of green building in the design, a solar panel system was added to the rooftop of the building (Figure 7). These solar panels can be used to turn on lights in certain areas.



Figure 7. Solar Panel Units (Source: Author, 2023)

3.3. Rainwater Management System

Responding to the location of the site with a tropical climate, a design of a rainwater management system that falls on the building is prepared. Rainwater from the rooftop will be collected and recycled for use in toilet flushing systems and plant treatments.

CONCLUSION

The conclusion of the design of e-sports training facilities with green building nuances with a futuristic principle approach is as follows:

1. The design of the building site is placed in the middle of the land, to provide undeveloped areas on all sides of the site for green areas to reduce global warming.
2. The façade of the building uses wide glass combined with a curtain wall frame so that natural lighting in the space in the building is more optimal. The placement of line ornaments on the outer side, as secondary skin, reduces the radiance of sunlight in the afternoon.
3. The use of prefabricated materials has advantages in terms of shape, size, and ease of installation. The use of ACP combined with exposed steel frames without repainting is a measure to reduce pollution and a representation of honesty.

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