Urban Park Design as an Enhancement of Public Spaces in Medan City (Landscape Architecture Perspective)

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A R T I C L E I N F O

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A B S T R A K

Urban parks, as a form of public open space, play a vital role in creating healthy, aesthetic, and sustainable urban environments. Medan City, as one of Indonesia's major metropolitan areas, faces various urbanization challenges such as the reduction of public spaces, land conversion, and environmental degradation. This study focuses on the design of an urban park using a landscape architecture approach that balances ecological, social, and recreational functions. The research employs a qualitative descriptive method, with data collected through literature review, field observation, and precedent studies of comparable parks. The findings highlight the importance of applying structured site zoning, integrating hardscape and softscape vegetation, and providing inclusive and universal facilities accessible to all community groups. In conclusion, urban parks have the potential to serve as spaces for social interaction and environmental enhancement when designed based on contextual and sustainable landscape architecture principles.

INTRODUCTION

In recent decades, Medan City has experienced rapid urban growth that has triggered a range of spatial and environmental challenges, including land-use conversion and the diminishing quality of public open spaces. One of the most notable consequences is the reduced availability of areas that support social interaction and community recreation. In response, urban parks have become a strategic alternative to fulfill the growing demand for public spaces that are safe, inclusive, and comfortable for all citizens.

Beyond their recreational purpose, urban parks serve important ecological and social functions. Through the application of landscape architecture principles, green open spaces can foster stronger connections between humans and their natural surroundings while improving urban residents' overall quality of life. According to the ideal standard that recommends 30% of a city's total area be dedicated to green open space, the establishment of well-designed urban parks is essential for maintaining the ecological balance and livability of urban environments.

The landscape architecture approach offers an integrated framework that harmonizes function, aesthetics, and sustainability in outdoor spatial design. This research aims to develop a conceptual design for an urban park in Medan that emphasizes clear spatial zoning, the use of contextually appropriate vegetation, and the inclusion of universal facilities accessible to diverse user groups, including individuals with disabilities. The study focuses on addressing three main issues: how to design an urban park that effectively meets public space needs in Medan through a landscape-based approach; how to ensure optimal spatial functionality; and how to identify the key social and environmental roles of urban parks in city life. Moreover, this research is expected to contribute to multiple stakeholders — providing learning resources for students, practical value for the public, and policy insight for local governments in directing sustainable urban spatial development.

LITERATURE REVIEW

The rapid urban expansion of Medan City in recent decades has created complex spatial and environmental challenges, such as land-use conversion, reduced public open space, and declining environmental quality. These changes have limited spaces for social interaction and recreation, diminishing the quality of urban life. To address this issue, urban parks are proposed as strategic interventions that provide inclusive, safe, and sustainable public environments for all citizens.

Urban parks serve not only as recreational areas but also as vital elements in maintaining ecological balance, improving microclimate conditions, and fostering community well-being. According to Kabisch et al. (2017) and Zhang et al. (2022), urban green spaces significantly enhance social cohesion, mental health, and climate resilience in rapidly

urbanizing regions. The integration of landscape architecture principles—combining function, aesthetics, and sustainability—can thus strengthen human–environment relationships while promoting long-term urban livability.

This research adopts a qualitative descriptive approach, utilizing literature review, field observation, and precedent studies of successful parks such as Taman Gajah Mada (Medan) and Taman Menteng (Jakarta). The design emphasizes clear zoning systems, the balance of hardscape and softscape elements, and universal accessibility, following UN-Habitat (2020) recommendations for inclusive public space design. The planning framework aligns with Indonesia's National Standard (SNI 03-1733-2004), which requires a minimum of 0.3 m² of green open space per resident, supporting the World Health Organization (2016) guideline that at least 30% of urban land area should remain green.

Theoretically, this study draws on Gehl's (2010) concept of "life between buildings," emphasizing human-scale interaction, and Beatley's (2016) idea of "biophilic cities," which underscores nature-integrated design as essential for sustainable urban futures. The proposed design for Medan's urban park aims to create layered spatial zones that integrate vegetation, circulation, and communal facilities, ensuring accessibility for all—including persons with disabilities as stated in Permen PU 30/PRT/M/2006.

METHODOLOGY

Design Analysis Summary – Urban Park Design in Medan City

1. Site and Environmental Analysis

The selected site for the urban park is located within Komplek MMTC, Jalan Selamat Ketaren, Medan Tembung, covering an area of approximately 28,424 m². The location is considered strategic due to the availability of key utilities such as electricity, water supply (PDAM), and telecommunication networks. However, two challenges were identified — moderate traffic congestion and a relatively long distance from the city center.

Figure 1. Existing Site Map (Source: cad-atlas.com)

The site lies at coordinates 3°36′05.9″N 98°42′30.7″E and can be reached within 20 minutes from downtown Medan.

2. Land Use and Boundaries

The land-use analysis determined that 80% of the total area is allocated for green open space, equivalent to 22,739.2 m², while 10% (2,842.4 m²) is designated for built structures.

Figure 2. Site Boundary Map (Source: Author's Analysis)

The site is bordered by residential areas to the east and south, educational buildings to the west, and commercial units (ruko and warehouses) to the north. Based on access potential, the northern boundary was chosen as the main entrance and exit point, as it connects directly to the main MMTC road.

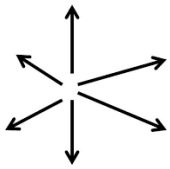
3. Entrance and Circulation

Two entrance design alternatives were evaluated. The first alternative—locating the main vehicle entrance on the north and a pedestrian entrance on the east—was selected for its efficient circulation and accessibility.

Figure 4. Entrance Analysis (Author's Sketch)

For internal movement, the radial and spiral circulation pattern was adopted. This hybrid model allows visitors freedom of movement (radial) while maintaining clear orientation toward central activity zones (spiral).

Table IV.1 summarizes the advantages of both systems—radial patterns promote exploration, while spiral layouts enhance focus and spatial flow.

NO	Circulation Type	Characteristics	Advantages	Disadvantages
1	Radial 	Connects spaces through a spreading circulation pattern.	Provides visitors the freedom to explore the designed area.	Orientation is in all directions; if not well-organized, it may cause visitors to become confused.
2	Spiral 	Rotates dynamically from a central point.	Clear orientation toward a single point even though the path circles around the center with varying distances.	If this circulation pattern is applied to a large area, it can create a sense of monotony.

4. Parking and Access Design

The park is designed to accommodate 1,000 visitors, with 30% arriving by car and 70% by motorcycle. Thus, approximately 1,344 m² is allocated for cars and 706 m² for motorcycles.

Among the three tested layouts—0°, 45°, and 90° parking systems—the 90° system was chosen for its efficiency and capacity optimization.

5. Functional Zoning

The park layout consists of five functional zones:
Public Zone – main and secondary entrances, selfie and relaxation areas.
Service Zone – parking lots, management office, toilets, and prayer room.

Sports Zone – jogging track, basketball and badminton courts.
Educational Zone – children's playground and Wi-Fi learning area.
Economic Zone – food court and small commercial stalls.

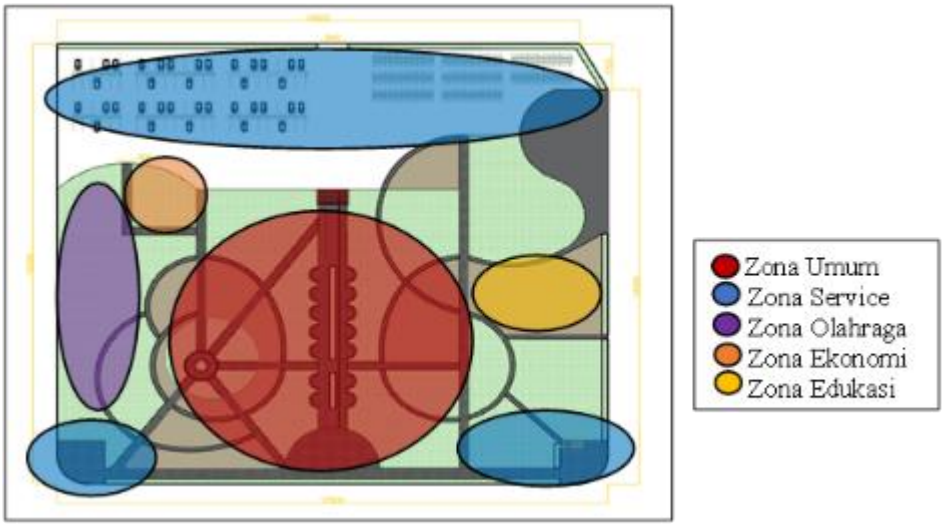


Figure 4.6. Zoning Diagram (Source: Author's Design)

This zoning structure ensures a balance between recreation, education, economy, and ecology, in line with sustainable park planning principles.

6. Spatial Relationships and Activities

The park's spatial organization was developed based on user behavior patterns.
Managers: use areas for administration, rest, worship, and utilities.
Visitors: engage in recreation, social interaction, education, sports, and dining.

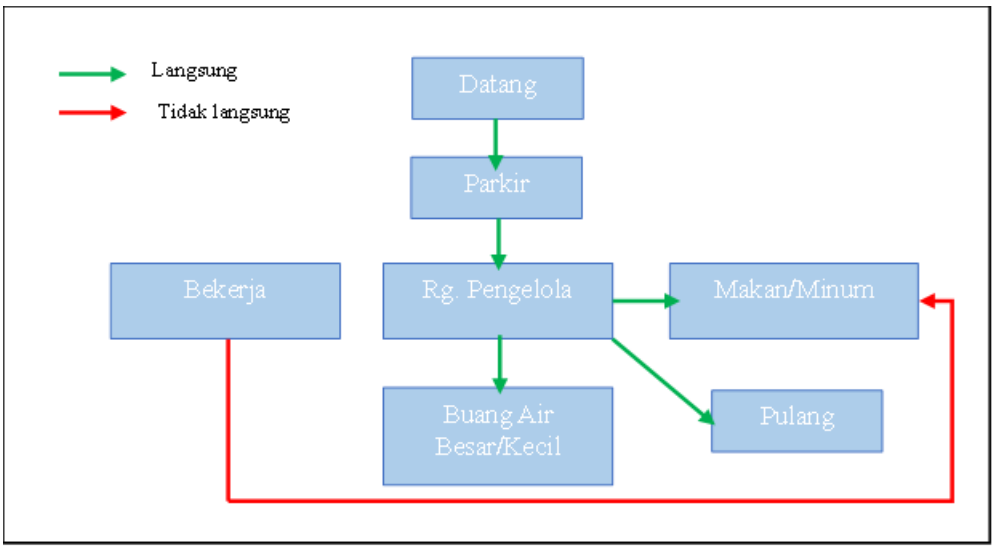


Figure 7.

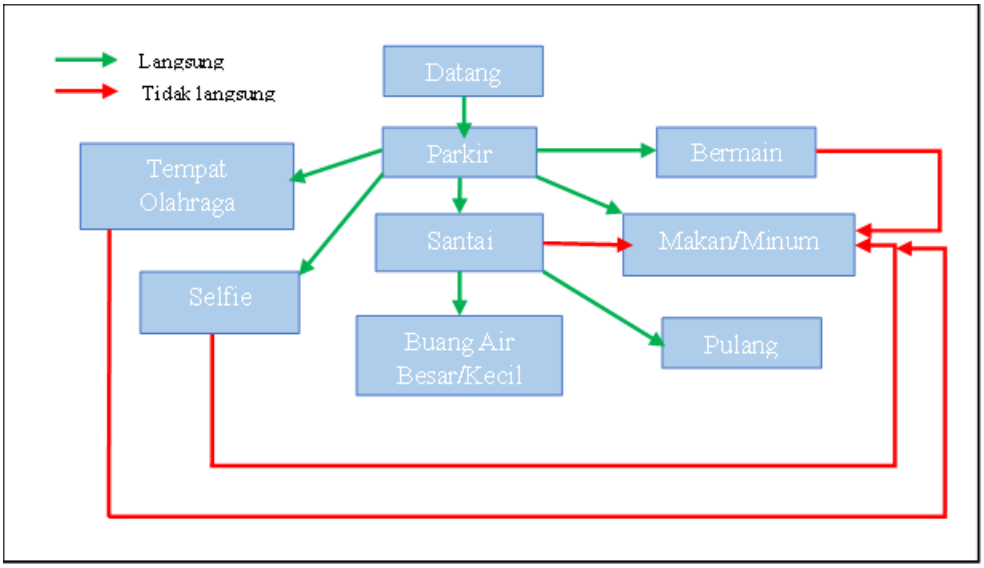


Figure 8

Figure 7, 8. Space Relationship Diagrams for Managers and Visitors (Author's Design).

These patterns reflect Ernst Neufert's spatial standards for efficient and human-centered outdoor planning.

7. Landscape Materials

To enhance ecological and aesthetic value, the design employs both softscape and hardscape elements:

Softscape Materials:
Includes shade and ornamental plants such as Kiara Payung, Palem, Cemara, Flamboyan, Pucuk Merah, Bougainvillea, and Lavender.
Each species is chosen for specific ecological functions—shade, pollution absorption, erosion control, and noise reduction.

Table 2 . Example Vegetation Images

NO	Type of Vegetation	Function	Characteristics	Picture
1	Kiara Payung Tree	Wind director, pollutant filter, noise reducer, shade provider, and visual control element.	Broad leaves, can reach up to 5 meters in height.	
2	Palm Tree	Boundary marker and directional guide.	Approximately 5 meters tall.	
3	Cemara (Pine) Tree	Serves as a road guide, provides shade, acts as a boundary marker, and reduces evaporation.	Conical shape, about 20 meters tall.	
4	Flamboyant Tree	Provides protection or shade, absorbs pollutants, and serves as a buffer.	Has a wide canopy shaped like an umbrella, approximately 10 meters tall.	

5	Pucuk Merah (Red Shoot) Tree	Serves as a shade provider and absorbs pollutants.	Has a small and dense crown, approximately 10 meters tall.	
6	Mini Elephant Grass	Used for soil and water conservation.		
7	Local Lavender Flower	Used as herbal medicine, aromatherapy, and mosquito repellent.	Naturally purple in color, stick-shaped, about 1–2 meters tall.	
8	Fountain grass	Serves as a border plant, ornamental plant, and ground cover.	Has narrow, long, and upright leaves; grows quickly under sunlight; drought-tolerant.	
9	Bougainvillea	Acts as a boundary plant, refreshes the air, fights free radicals, and absorbs air pollution.	Branching with hard and thorny stems, compound flowers, grows densely.	

Hardscape Materials:

Uses perforated paving blocks to promote water infiltration and reduce heat reflection. These materials are applied in pedestrian paths, parking zones, and gathering areas, supporting sustainable surface management**.**

8. Climate and Environmental Considerations

Medan has a tropical climate with average temperatures between 23°C and 33°C, humidity levels of 78–82%, and rainfall peaking at 150–300 mm/month.

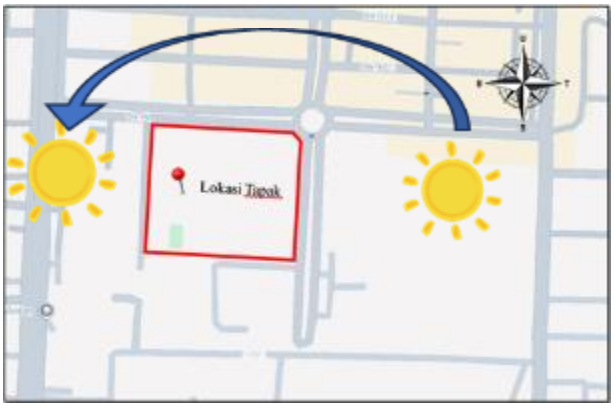


Figure 9. Sunlight Analysis – the eastern portion of the site receives strong morning light, prompting the placement of shade trees as solar filters.

Figure 10. Rainfall Chart – high precipitation necessitates adequate drainage infrastructure.

Wind analysis showed low but steady air movement (3.5 km/h), with occasional gusts. Vegetation barriers are used to regulate wind flow across open areas.

9. Noise and Drainage Analysis

Noise mainly originates from nearby arterial roads (Jl. Selamat Ketaren and Jl. Williem Iskandar). Buffer vegetation and earth mounds are proposed along the northern edge to mitigate acoustic disturbance.

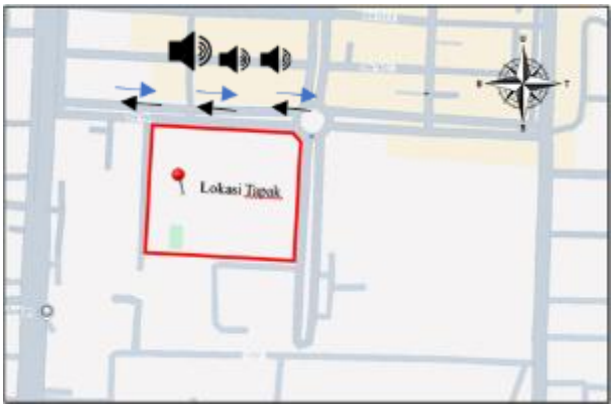


Figure 11. Noise Mapping

For drainage, the site's flat topography requires engineered channels along perimeters to prevent flooding during heavy rain.

Figure 12. Drainage Pattern Diagram

RESEARCH RESULT

Parking Concept

The parking concept applies a 90-degree parking layout, which efficiently accommodates up to 80 cars while optimizing land use. This system was selected because it allows for organized vehicle circulation and maximizes capacity within a limited area.

Figure 13. Car Parking Concept
Source: Author's Documentation

Similarly, for two-wheeled vehicles, the same 90-degree pattern is used. This layout enables the parking area to hold a large number of motorcycles while maintaining clear and safe movement for users.

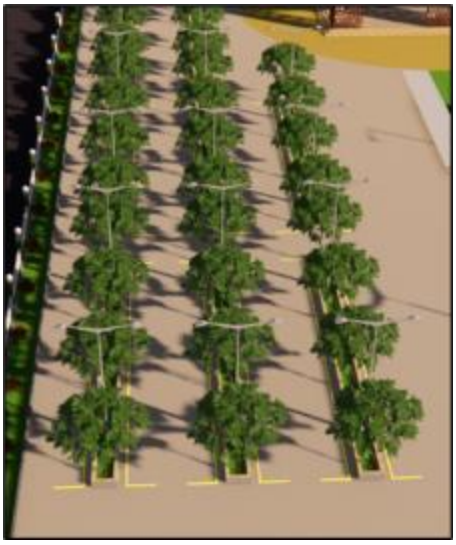


Figure 14. Motorcycle Parking Concept
Source: Author's Documentation

Spatial and Facility Concept

The park design integrates a range of public facilities aimed at fulfilling the recreational, spiritual, and social needs of visitors. Each facility is designed with attention to accessibility, comfort, and inclusivity.

a. Prayer Room (Musholla)

The prayer room is designed as a semi-open structure, allowing natural ventilation and a sense of openness. A partition curtain is installed in the women's prayer area to ensure privacy and comfort for female worshippers.

Figure 15. Prayer Room Concept (Musholla)
Source: Author's Documentation

b. Gazebo

A total of 14 gazebos are distributed throughout the park and can be freely used by visitors. Each gazebo is open-sided to allow users to enjoy the surrounding views, providing a relaxing atmosphere within the landscape.

Figure 16. Gazebo Concept
Source: Author's Documentation

c. Sports Facilities

The park includes sports facilities such as a jogging track, basketball court, and badminton/volleyball courts. These areas not only support healthy lifestyles but also serve as communal spaces for social interaction and sporting events.

Figure 17. Sports Facility Concept
Source: Author's Documentation

d. Playground

A children's playground is provided as an interactive and safe recreational zone. The area features play equipment designed to encourage creativity and physical activity for children visiting the park with their families.

Figure 18. Playground Concept
Source: Author's Documentation

e. Toilet Facilities

Public toilets are distributed at several points across the park to ensure user convenience and hygiene. Their placement is designed to be easily accessible from all zones.

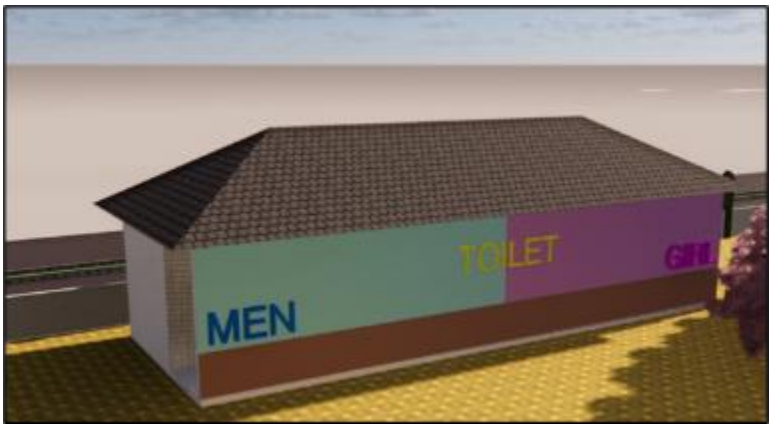


Figure 19. Toilet Concept
Source: Author's Documentation

f. Canteen

The canteen area provides food and beverage facilities, allowing visitors to relax, dine, or simply purchase snacks. This facility also encourages small-scale economic activity by supporting local vendors.

Figure 20. Canteen Concept
Source: Author's Documentation

Material Concept

The hardscape materials used in this design consist primarily of dual-tone permeable paving blocks. These materials prevent puddles by allowing rainwater to infiltrate the soil directly, thus promoting sustainable water management. The visual contrast between the two paving colors adds to the park's aesthetic appeal while maintaining environmental functionality.

Figure 21. Hardscape Material Concept
Source: Author's Documentation

Vegetation Concept

The vegetation concept integrates nine plant species to create a lush, diverse, and environmentally balanced landscape. These include:
Bougainvillea, Fountain Grass, Lavender, Dwarf Elephant Grass, Red Shoot Tree (Pucuk Merah), Flamboyant Tree, Pine (Cemara), Palm Tree, and Kiara Payung.

Each species contributes unique ecological and aesthetic benefits — from shading and pollution absorption to noise reduction and visual enrichment. The variety of plant forms, colors, and textures provides both ecological value and spatial harmony within the park.

Figure 22. Vegetation Concept
Source: Author's Documentation

DISCUSSION

The existence of urban parks in Medan City is a crucial necessity that must be addressed by the local goverment. Urban parks serve as important public spaces where residents can fulfill their recreational needs and find relief from the pressures of urban life. Beyond recreation, these parks also play a vital environmental role by helping to reduce air pollution caused by motorized vehicles.

Therefore, the writer concludes that the "Design of an Urban Park as a Fulfillment of Public Space in Medan City" is an essential initiative that should be implemented to bring tangible benefits to the community. This thesis project, located in Percut Sei Tuan District, Medan, presents an urban park design developed through the conceptual approach of Landscape Architecture.

The application of landscape architectural principles is necessary to meet community needs across social, economic, and ecological dimensions. Through this design proposal, the author aims to contribute positively to the residents of Medan, particularly to students and young people. In addition to providing recreational facilities, the park also offers educational amenities and Wi-Fi zones that are easily accessible to the public. Each facility has been thoughtfully designed to address the essential needs of the community, supporting both leisure and learning within a sustainable urban environment.

CONCLUSIONS AND RECOMMENDATIONS

For the Local Government:
It is recommended that the Medan City Government pay greater attention to the development and maintenance of urban parks as essential public facilities. The implementation of sustainable landscape architecture should become a key consideration in future urban planning to ensure that public spaces remain accessible, inclusive, and environmentally balanced.

For the Community:
The community is encouraged to actively participate in maintaining and utilizing the urban park responsibly. Public awareness of the importance of green open spaces should be strengthened, as community involvement plays a vital role in preserving the park's ecological and social functions.

For Educational Institutions:
Educational institutions, especially schools and universities, can use the park as an outdoor learning environment. The integration of educational activities within public spaces such as parks can enhance students' understanding of environmental awareness and sustainable design.

For Future Researchers:
Future studies may further explore the optimization of urban park functions through smart technology integration, climate-responsive landscape design, and community-based management systems. This would strengthen the park's role as both a recreational and educational space in the context of sustainable urban development.

For Designers and Planners:
Urban planners and landscape architects are encouraged to continue innovating in creating parks that harmonize natural and built environments. The design process should prioritize human experience, ecological health, and adaptability to urban growth.

ADVANCED RESEARCH

Smart and Interactive Urban Parks

Future research could focus on integrating smart technology into park management and visitor experience — such as smart lighting, digital information boards, environmental sensors, and app-based park monitoring systems. This would enhance efficiency, safety, and community engagement in the use of public spaces.

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