



PLANNING AND DEVELOPMENT OF A FAMILY ENTERTAINMENT CENTER WITH A PLAYFUL ARCHITECTURE APPROACH IN MEDAN: A MULTIDIMENSIONAL ARCHITECTURAL RESEARCH REPORT

Wahyu Abdillah ^a, Luis Armando Simbolon ^{b*}

^a Faculty of Engineering / Department of Architecture; wahyu5@usu.ac.id; Universitas Sumatera Utara; Kec. Medan Baru, Kota Medan, Sumatera Utara

^b Faculty of Engineering / Department of Architecture; luisarmandosimbolon@gmail.com; Universitas Sumatera Utara; Kec. Medan Baru, Kota Medan, Sumatera Utara

* Penulis Korespondensi: Luis Armando Simbolon

ABSTRACT

This research report presents a comprehensive plan for the development of a family entertainment center designed through the lens of playful architecture in the city of Medan, North Sumatra. Titled “Funtastic Bound To Bond”, this project was conceived in response to the growing need for inclusive, safe, and educational recreational spaces amidst increasing urban density and the scarcity of adequate public open spaces in the Mebidang metropolitan area (Medan, Binjai Deli Serdang). By integrating three main conceptual pillars—Playful Connectivity with Local Memory, Intergenerational Bonding Space, and Experiential Multi-Level Recrea-Mall—this design aims to transform historical urban movement patterns into spatial explorations that foster intergenerational interaction. The theoretical foundation of this research is rooted in environmental psychology and family psychology, which specifically examine how behavioral settings and cognitive mapping can influence visitors’ moods and emotional well-being. The research methodology includes a systematic literature review, technical site analysis at Namo Simpur, user behavior observations, as well as international case studies such as LEGO House and Lotte World to ensure competitive quality standards. The design proposal suggests a layered recreational complex encompassing interactive play zones, thematic learning spaces, a public plaza, and an integrated commercial center supported by sustainable design strategies such as passive ventilation and natural lighting. This study concludes that a playful approach is not merely an aesthetic choice but a crucial architectural strategy for strengthening family bonds and urban identity in Medan.

Keywords: *Playful Architecture; Family Recreation; Urban Public Space; Environmental Psychology; Medan; Intergenerational Bonding.*

1. INTRODUCTION

The dynamics of modern life in the era of globalization have brought significant changes to social structures and interactions within the smallest unit of society: the family. In a fast-paced and high-pressure world, quality time is often overlooked, even though warm and meaningful interactions are crucial for building harmonious and mutually supportive relationships. This crisis in social interaction is further exacerbated by the massive penetration of digital technology. According to 2023 data from the Central Statistics Agency (BPS) [7], 38.92% of young children in Indonesia have used smartphones, with 32.17% of them actively accessing the internet. This phenomenon creates a paradox where technological advancement is not accompanied by the development of social skills, which in turn fuels dependence on devices and reduces direct interaction among family members.

The urgency of strengthening family functions has become a national priority, as outlined in the National Medium-Term Development Plan (RPJMN) 2020–2024 and supported by the Indonesia Emas 2045 vision. The government, through the Coordinating Ministry for Human Development and Culture (Kemenko PMK), emphasizes the importance of character development through the quality of family life. However, social realities reveal significant challenges; data from the National Population and Family Planning Board (BKKBN) indicates that the number of divorces in Indonesia reached 580,000 cases in 2021, with disharmony being one of the main reasons, this figure has increased or decreased compared to the previous year. This highlights the fragility of family stability, which requires intervention through the provision of social infrastructure capable of facilitating emotional bonding.

The city of Medan, as the largest metropolitan area in North Sumatra with 523,097 families in 2024 [8], faces similar challenges. Medan's urban population has high demands for family recreational spaces, yet the availability of existing facilities is considered extremely limited. A survey of 100 respondents in Medan provides a clear picture of this situation:

This figure has increased or as many as 54% of respondents stated that recreational areas in Medan were inadequate, 28% stated that they were very inadequate, and only 18% stated that they were adequate or other, a decrease compared to the previous year. The data indicates a significant gap between public needs and the availability of functional public spaces. Most existing recreational facilities are currently limited to indoor playgrounds in conventional shopping malls, which are often generic and fail to provide meaningful educational experiences or deep psychosocial stimulation. Furthermore, 51% of respondents believe that community-based recreational facilities are urgently needed, and 76% expressed a preference for recreational activities within the city if the quality of facilities meets international standards. This urgent need is also driven by historical and urban identity aspects; collective memories of Taman Ria Medan, operating from the 1980s to the early 2000s, Taman Ria Medan is known as a popular amusement park with a variety of rides and family recreation areas, demonstrate how recreational spaces can shape residents' identity and happiness—a role currently unfulfilled by any comparable new landmark.

Legally, this planning initiative also constitutes an effort to fulfill children's rights as stipulated in Medan Mayor Regulation No. 65 of 2023 on Child-Friendly Cities (Kota Layak Anak (KLA)), which guarantees children's rights to play, engage in recreation, and receive protection. Therefore, the design of a Family Entertainment Center (FEC) using a playful architecture approach has become a necessity that is not only commercially valuable but also carries broad social-psychological impacts. Through an environmental psychology and intergenerational architecture approach, this design aims to create a healthy, harmonious, and educational environment for the modern community of Medan.

The primary focus of this research is to address design challenges regarding how to create play facilities that support children's cognitive, social, and emotional development while facilitating effective intergenerational interaction. The principles of playful architecture are applied not merely as decorative elements, but as a medium for learning and exploration capable of uniting retail, educational, and entertainment elements into a holistic recreational ecosystem. Through an architectural approach that is responsive to the psychological needs of its users, this project is expected to make a tangible contribution to the provision of inclusive and child-friendly family facilities in the city of Medan.

2. METHODS

The methodology used in this planning process is designed to integrate quantitative data from surveys and regulations with qualitative analysis grounded in architectural and psychological theories. A systems approach is employed to study the interaction between human behavior and its environment as a single, mutually interdependent unit.

2.1. Data Collection Procedures and Literature Review

This study began with the collection of primary and secondary data through several systematic stages:

- a. **Literature Review and Regulatory Analysis:** An in-depth review was conducted of books, journals, and previous research on environmental psychology, intergenerational architecture, and user behavior patterns. Official regulations such as Law No. 35 of 2014 [17] on Child Protection and the 2022–2026 Medan Child-Friendly City (KLA) Regional Action Plan served as the legal basis for the design.
- b. **Field Observation Study:** The research team visited existing recreational facilities such as Mikie Holiday Funland and Playtopia to document the physical condition of the site, circulation, comfort, and safety measures implemented.

- c. **User Survey:** Questionnaires were distributed to parents and children in Medan to assess facility needs, satisfaction levels, and design preferences (such as the desire for an iconic façade expressed by 84% of respondents, from a survey conducted on 100 respondents).
- d. **Comparative Study (Precedents):** An analysis was conducted of international-scale projects such as Universal Studios Singapore and LEGO House to understand the integration of recreational and educational functions within a single immersive environment.

2.2. Analysis of Site Conditions and Technical Environment

The project site is located in Namo Simpung, Pancur Batu District, Deli Serdang, and serves as a transitional corridor between the city of Medan and the suburban area. A technical analysis was conducted using ten key parameters to ensure the design's alignment with the local context:

Data Categories	Analysis Objectives	Implementation Methods
Land Physical Conditions	Determining functional suitability with the surrounding environment	Digital mapping (Google Earth/Maps) and on-site topographic surveys.
Sun Orientation	Optimizing natural lighting and thermal comfort	Shadow simulation using SketchUp and Sun Path analysis.
Visual and Views	Determining mass orientation for maximum visual appeal	Panoramic documentation and observation of surrounding landmarks.
Building Regulations	Ensuring compliance with RDTR and Ministry of Public Works and Public Housing (KemenPUPR) standards	Consultation with the spatial planning agency and study of child-friendly space standards.
Accessibility	Ensuring safe movement for children and the elderly	Mapping of access routes and analysis of traffic density on main routes.
Local Architectural Character	Integrating Medan's identity into a playful design language	Analysis of local forms, patterns, and materials from historic buildings in Medan.
User Activities	Understanding the relationship between play spaces and family psychology	Mapping children's behavior in public spaces and focus group discussions with education experts

2.3. Analytical Framework, Methods, and Design Implications

The collected data was then analyzed using the design implication correlation method to generate responsive design strategies:

- a. **Climate and Thermal Analysis:** Medan has an average temperature of 23–32°C with high humidity. This necessitates the use of cross-ventilation, child-friendly materials (that do not absorb excessive heat), and the provision of shaded areas in the outdoor play zones.
- b. **Topographic Analysis:** The relatively flat terrain (elevation ± 27 m above sea level) makes construction easier, but variations in micro-topography are utilized as play elements such as natural slides or tiered amphitheatres to enhance the spatial experience.
- c. **Socio-Spatial Dialectic Analysis:** Combining mapping data with field observations to identify areas suitable for “*behavior settings*”—a stable combination of specific activities and their locations.
- d. **Exploration of Playful Architectural Concepts:** Developing dynamic and expressive forms. Architectural elements such as interactive ramps, bridges, and play walls serve not only as connectors but also as tools for sensory stimulation (visual, auditory, tactile).

This research also emphasizes child safety and comfort, where line-of-sight considerations and the selection of non-sharp materials are top priorities in every designed spatial module. With this comprehensive methodology, the planning of the Family Entertainment Center (FEC) in Medan is aimed at addressing the lack of quality public spaces in the Mebidang area.

3. RESULTS AND DISCUSSION

The discussion in this report explores how psychological theories and principles of playful design are translated into tangible architectural solutions for the people of Medan. Emphasis is placed on the integration of commercial, educational, and recreational functions into a cohesive ecosystem.

3.1. Theoretical Framework: Environmental and Family Psychology

The design of this Family Entertainment Center is based on the understanding that physical space has a profound influence on human behavior and emotional well-being. Two main theories of environmental psychology are applied extensively:

1. **Behavior Setting Theory.** According to the theory developed by Roger Barker, every space must be designed to meet specific, consistent behavioral standards (synomorphy). In the context of the FEC in Medan, this means that active play zones must have an environmental setting (milieu) that supports fast-paced movement and high social interaction, while quiet zones are designed with soft acoustics to support rest or reflection. Identification of “Standing Patterns of Behavior” is conducted to ensure that the provided facilities are actually used in accordance with the psychosocial needs of children and parents.
2. **Cognitive Mapping and Navigation Complex recreational** Environments can trigger anxiety if they lack a clear wayfinding system. This FEC design uses themed visual landmarks and a central atrium as mental anchors for visitors. By understanding how humans simplify and organize spatial information, the playful architecture here serves to facilitate intergenerational navigation, allowing parents to feel more in control while supervising their children.

From a family psychology perspective, this study adopts the “Intergenerational Transaction of Emotional Health” model. The reciprocal relationship between gratitude and the mitigation of depression in parents and children is the primary design focus. Interactive spaces are designed to stimulate a mindset of gratitude through shared positive experiences, which have been clinically proven to reduce symptoms of emotional distress among family members.

3.2. Application of the Principles of Playful Architecture

Playful architecture is defined not merely as an aesthetic style, but as an approach that combines psychological, social, and functional aspects to create happiness. Based on the “Playful Cities Design Guide,” there are five main principles applied in this FEC Medan project:

Design Principles	Applications at the Medan Family Entertainment Center	Psychosocial Impact
Accessibility	Universal access for children, seniors, and people with disabilities via gentle ramps and themed elevators.	Removing physical barriers and fostering social inclusion.
Interactivity	Integration of “Sound Tiles” and “Xylophone Benches” that respond to user movement.	Encouraging active participation and sensory exploration.
Flexibility	Use of modular spaces for reconfigurable educational studios.	Ensuring long-term functional sustainability.
Creativity	Provision of “Loose Big Blocks” and interactive mural walls.	Stimulating imagination and problem-solving skills.
Social Connection	Design of a “Giant Seesaw” and a communal plaza requiring collaboration between at least two people.	Strengthening interpersonal relationships and the community’s social capital.

Through these principles, architecture is no longer a passive container but becomes the “playground” itself. For example, a slide is not merely placed in a corner of the room but integrated as a mode of vertical circulation connecting the retail floor with the recreational zone, creating a surprising and enjoyable sequence of spaces.

3.3. Synthesis of Precedent Studies and Contextual Relevance

Analysis of various case studies offers valuable lessons in designing recreational facilities in a competitive market:

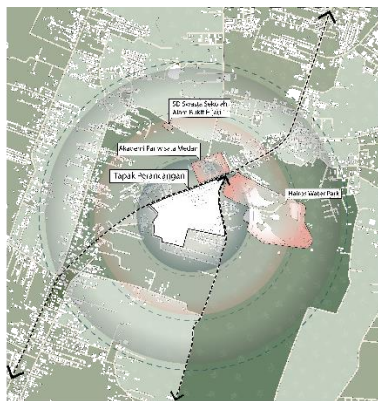
- a. LEGO House Bjarke Ingels Group (BIG): Provides inspiration regarding the “Learning through Play” philosophy. The building functions as a multisensory exploration tool that integrates education and entertainment.
- b. Lotte World Seoul: Demonstrates the successful integration of an indoor amusement park with a recreational mall in a vertical layout, maximizing the use of limited land in a densely populated area.

- c. Trans Studio Mini: Serves as a key reference for combining retail, social spaces, and family-friendly attractions within a compact yet immersive indoor environment.
- d. Saloka Park: Offers a lesson on the importance of a locally-rooted approach. The use of folk legends like Baru Klenting creates a strong emotional bond with the local community.
- e. Universal Studios Singapore: Emphasizes “Architecture as an Emotional Experience,” where each zone creates a distinct atmosphere to foster lasting family memories.

In Medan, this approach is adapted to the local collective memory. Reimagining elements of Taman Ria Medan through the language of modern architecture has the potential to make this project a new city landmark (landmark creation) capable of strengthening the identity of the space and retaining residents’ recreational activities within the country.

3.4. Site Information and Urban Strategy for Medan

The selection of the site at the administrative border of Medan and Deli Serdang (Namo Simpur) is a strategic move to serve the Mebidang metropolitan system. This area is an active transition zone with established recreational activity intensity due to its proximity to Hairos Water Park



Picture 1. Map of the site location in Namo Simpur

1. Visibility and Visual Markers: Located along the main road corridor leading to Berastagi, the building is designed with an iconic façade (approved by 84% of survey respondents) that serves as a visual marker for the area.
2. Tropical Climate Response: Given high rainfall and humid temperatures, the design optimizes natural ventilation and vegetation as thermal buffers. The use of a “Green Labyrinth” and thematic gardens in open areas helps distribute crowds and creates a cool microclimate.
3. Regulatory Compliance: This plan adheres to Medan City Regulation No. 1 of 2022, with a Floor Area Ratio (FAR) between 60–80% and the provision of green areas as water infiltration zones.

3.5. Implementation of Three Key Design Concepts

The operational planning for the FEC “Funtastic Bound To Bond” is articulated through three mutually integrated spatial strategies:

1. Playful Connectivity with Local Memory This concept transforms Medan’s dynamic urban movement patterns into pathways for exploring the building. Local architectural elements, such as traditional roof patterns or processed wood materials, are combined with modern materials like brightly colored rubber surfaces to create a cheerful atmosphere that still maintains strong cultural roots.
2. Intergenerational Bonding Space The programming of the space is not only focused on children but also on parents and the elderly. The availability of “Work Watching” and “Experiential Dining” areas allows adults to relax or work while safely monitoring children through carefully planned sightlines (visual permeability).
3. Experiential Multi-Level Recrea-Mall This facility is designed as a “Recreational Mall” where commercial activities support play experiences.
 - Level G (Arrival & Public Plaza): A transitional zone featuring an iconic gateway and an information center.
 - Level 1 (Intensive Play Zone): A hub for high-energy activities such as a mini roller coaster and 4D motion rides.

- Level 2 (Education & Studio): Spaces for modular educational programs, interactive exhibits, and children’s art zones.¹
- Level 3 (Quiet & Sensory Zone): Support facilities such as nursing rooms, sensory play areas for children with special needs, and family lounges.¹

3.6. Space and Building Technology Program Analysis

The space program analysis ensures that each zone meets functional needs without compromising the interactive experience.¹ Circulation within the play zone is designed as a loop system to encourage continuous exploration.

Program Zones	Special Spatial Requirements	Applied Technologies
Play & Attraction Zone	High ceilings (double-height) and reinforced floor structures.	Wide-span steel frames (30-40 m) for column-free spaces.
Family & Quiet Zone	High acoustic control and soft lighting (dimmed lighting).	Sound system and sound-absorbing materials (modular acoustics).
Commercial Zone (Mall)	Flexible retail modules and visual permeability toward attractions.	Glass facade with UV coating to maximize natural light without excessive heat.

The primary structural system combines reinforced concrete for the core and a steel space frame for the atrium area. The foundation is designed using bored piles to withstand the dynamic loads from mechanical rides and lateral forces caused by earthquakes. To support sustainability, the building’s roof is equipped with solar panels and a gutter system integrated with rainwater management for landscape irrigation.

3.7. Psychological Impact and Mental Restoration

Based on Stephen Kaplan’s theory (Kaplan, 1995) regarding nature’s restorative benefits, this design integrates indoor vegetation and water elements (water channels). This is crucial because play areas often feature high-stimulation characteristics (vibrant colors, loud sounds) that can trigger mental fatigue or tantrums in children. A gradual transition from high-intensity zones to low-intensity zones (such as sandpits or gardens) is designed to maintain visitors’ emotional balance. An “intuitive” environment created through playful design has been proven by studies to reduce stress levels and enhance overall visitor satisfaction.

4. CONCLUSION

The planning of this Family Entertainment Center using a playful architectural approach in the city of Medan is a multidimensional solution that integrates social, psychological, and economic needs into a single integrated design framework. This study successfully demonstrated that architecture is not merely a shaper of physical space but an active instrument capable of facilitating intergenerational interaction and supporting children’s emotional development through the principle of the courage to explore (play for anyone, anywhere).

Some key conclusions from this planning are:

1. Integration of Psychology and Architecture: The use of behavior setting and Cognitive Mapping theories is highly effective in reducing navigation anxiety and ensuring recreational spaces function optimally in accordance with the behavioral patterns of modern families in Medan.
2. Strengthening Family Bonds: Through the “Funtastic Bound To Bond” concept, this design provides adequate infrastructure for emotional well-being interactions between parents and children, which is crucial amid high rates of technological disconnection and family breakdown.
3. Contextual Urban Response: The location in Namo Simpur, Pancur Batu subdistrict, Deli Serdang District, and the incorporation of Medan’s local identity ensure that this facility serves as a culturally relevant landmark and is responsive to the tropical climate of North Sumatra.
4. Recrea-Mall Ecosystem: The integration of retail, educational, and entertainment functions into the “Recreational Mall” model provides economic value while fulfilling the social mandate of Medan’s Child-Friendly City (Kota Layak Anak (KLA)) initiative.

Ultimately, the implementation of this plan is expected to improve the quality of life for the people of Medan, provide more inclusive public spaces, and serve as a benchmark for the development of recreational architecture in Indonesia that prioritizes human values and intergenerational solidarity significantly. With a safe and joyful environment, this Family Entertainment Center will become a place where beautiful memories are formed and the character of future generations can be strengthened.

REFERENCES

- [1] I. Altman. *The environment and social behavior: Privacy, personal space, territory, crowding*. Belmont, CA: Brooks/Cole, 1975.
- [2] Kaboom. *Playful cities design guide: Play for anyone, anywhere*. 2021.
- [3] S. Kaplan. “The restorative benefits of nature: Toward an integrative framework.” *Journal of Environmental Psychology*, vol. 15, no. 3, pp. 169–182, 1995, doi: 10.1016/0272-4944(95)90001-2.
- [4] P. Sari. *Family psychology*. 2020.
- [5] D. Setyowati and K. Wulandari. *Environmental psychology*. 2019.
- [6] J. W. K. Yeung. “Intergenerational transaction of emotional health in collective family context: Family functioning, parental and children’s gratitude, and their depression.” *Healthcare*, vol. 13, no. 2, p. 147, 2025, doi: 10.3390/healthcare13020147.
- [7] Badan Pusat Statistik. *Statistics on ICT utilization among early childhood*. 2023.
- [8] Badan Pusat Statistik. *Population statistics of Medan City*. 2024.
- [9] BKKBN. *National divorce statistics*. 2021.
- [10] Kementerian Koordinator Bidang Pembangunan Manusia dan Kebudayaan. *National long-term development plan (RPJPN) 2025–2045 and family quality program*. 2022.
- [11] Kementerian Koordinator Bidang Pembangunan Manusia dan Kebudayaan. “Screen-free hour” campaign in collaboration with SOS Children’s Villages. 2024.
- [12] Kementerian Pekerjaan Umum dan Perumahan Rakyat. *Child-friendly building standards*.
- [13] Pemerintah Kota Medan. *Peraturan Wali Kota Medan Nomor 65 Tahun 2023 tentang Kota Layak Anak*. 2023.
- [14] Kementerian Pariwisata dan Ekonomi Kreatif. *Peraturan Nomor 18 Tahun 2021 tentang usaha pariwisata taman rekreasi*. 2021.
- [15] Badan Perencanaan Pembangunan Nasional. *Rencana Pembangunan Jangka Menengah Nasional (RPJMN) 2020–2024*. 2020.
- [16] Badan Perencanaan Pembangunan Nasional. *Rencana Pembangunan Jangka Menengah Nasional (RPJMN) 2025–2030*. 2025.
- [17] Republik Indonesia. *Undang-Undang Nomor 35 Tahun 2014 tentang Perlindungan Anak*. 2014.
- [18] Indonesia.go.id. “Data on gadget usage among children aged 1–6 years.” 2024.
- [19] Jatim News / Antara. “Divorce statistics 2015–2021.” 2024.
- [20] Kaboom. “Playful cities design guide.” Internet: <https://kaboom.org> [diakses].
- [21] UNICEF. *Child-friendly cities framework*. 2022.
- [22] World Health Organization. *Healthy community planning guidelines*. 2022.
- [23] Bjarke Ingels Group (BIG). *LEGO House project documentation*. 2017.
- [24] Resorts World Sentosa. *Universal Studios Singapore: Park overview and statistics*. 2024.
- [25] Trans Studio Mini. *Official information and attraction guide*. 2023.
- [26] Mikie Holiday & Mikie Funland. *Company profile and attractions*. 2023.
- [27] T. Gill. *Urban play and child-friendly city*. 2021.
- [28] C. Montgomery. *The playful city: Urban happiness design*. 2022.
- [29] L. Smith *et al.* “Play streets and public health.” 2022.
- [30] M. Umstattd Meyer *et al.* “Play streets research series.” 2019–2021.