

Design Plan for Children's Library and Edutainment Center

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Abstract The children's library is a vibrant and attractive place designed to stimulate developing ideas. It provides children with educational, entertaining and cultural resources, including a large number of picture books, story books, non-fiction books and multimedia materials in multiple languages. Users can relax and read together in the outdoor children's garden, because it is a center of entertaining. The main purpose of the children's library is to increase literacy, share knowledge and obtain books, and then lend these books to the community for education and entertainment. It also allows children to share the book together instead of everyone having to buy their own copy. The main areas of the proposed project include the Discovery Center, the library, the administrative area, the skill area and the entertainment area. The site evaluation criteria considered include site capacity, accessibility, noise level, security and safety, visibility, location and environment, public facilities, shape/proportion, and future development plans. Therefore, the site of the project is located in the Al Nahda district of Jeddah, Saudi Arabia. All in all, the project developed facilities and environments, and created opportunities to learn skills and spread culture.

Keywords Library, Edutainment Center, Educational, Recreational, Cultural Resources

1. Introduction

The library provides a quiet study area for children or

students and encourages them to read [1]. In addition, libraries play a key role in cultivating literacy skills; especially those who need help developing reading skills, such as preschoolers and elementary school students [2]. The learning and education in early childhood is important as their mind as fresh to be molded and shape their thinking. The earlier the children access the information; they will become more efficient, confident and competent people [3]. Compared with the control group, children who have been exposed to library preschool usually show more emergency literacy behaviors and pre-reading ability [2].

Mark Smith revealed the ten major challenges faced by public libraries, such as increased distrust of the government, weakened confidence in objective information, decline in civilization and citizen participation, the disappearance of the middle class, tax resistance and tyranny of return on investment, and focus on power decline, decline in reading, lack of diversity, lack of recognition, and the struggle for library education [4]. He believes that if the integrity, determination, and commitment to professional mission and values are maintained, public libraries will exist and flourish in the future [4].

As known, reading has many benefits, including increasing readers' empathy, improving literacy and performance in various subjects, enhancing communication skills, exercising and expanding the brain, generating inner curiosity, providing entertainment value, and helping reduce stress [5]. Therefore, developing children's reading hobby as early as possible will be of great benefit to them in the future. Going to the public library as early as possible is a good way to encourage

children to love books and read. Usually, the library also provides audio books, bilingual books, e-books and magazines for children to read. Some libraries participate in special events to provide children's activities, weekend workshop and school holiday programs [6, 7]. This helps children develop a hobby of reading at an early stage. In addition, some libraries have story time, and the librarian chooses a book to read aloud to a group of young children [7]. Noise and conversation occurring in this part will help children develop their thinking and discover more from the book. In addition to borrowing books and listening to stories, some libraries also actively involve children in various activities such as enrolling in children's colleges, playing games, watching movies, and getting art awards [8].

Children's libraries provide the facilities for lifelong learning and literacy skills, enabling them to participate and contribute to the community [3]. With the advancement of technology and information, the library facilities have moved to another stage which is an e-library. The existing traditional library space was transformed into a Learning Center, which is an environment that attracts students and focuses on e-learning [9]. As an example, Ithra library provides not only books, but also digital resources to improve the quality of Arabic digital content [10]. Besides that, children can explore an array of edutainment activities at public library such as interactive workshops on painting, handicrafts, farming, cooking, origami and theatre [11]. The education and entertainment can combine together as an effective way for learning [12]. Therefore, this study proposed the children's library and edutainment center for benefiting the children and the society to allow discover many sciences, to stimulate interest, enjoyment.

2. Case Studies

The case studies facilitated in analyzing a superior comprehension for the areas, through elucidating the basic zones, capacities, and program and site criteria of a similar venture. The chosen case studies are Children's Library Discovery center, USA and Massar Children's Discovery Centre and Library, Syria. Both case studies are a part of educational institutions and clear circulation. The case study one has a clearer layout to understand and good distribution of zone. Both case studies have easy accessibility for building and have more parking.

2.1. Children's Library Discovery Center

Children's Library Discovery center is located in NY, USA (Figure 1) [13]. It is an addition to the Queens Central Library buildings. The Children's Library and Discovery Center create space for interactive science exhibitions and provide visitors with a fascinating hands-on learning experience. The center has independent reading spaces,

media stations, collaboration areas and rest areas, which are arranged in an open manner to create a rich and cohesive user experience, integrating a quiet reading corner with an informal social space.



Figure 1. Children's Library Discovery center [13]

This case study plans to renovate and modernize the 275,000 square feet Queens Central Library. The master plan is part of the New York City Design and Construction Excellence program initiated by Mayor Bloomberg in 2004 [13]. There are some children's books and special area for children on the first floor. The second floor contains most of the children's collections, open reading lounge, network center and activity room.

The building facade is composed of four different types of glass, which are transparent, translucent, opaque, and opaque with texture [13]. The luminous glass curtain wall is a beacon to the surrounding community and is essential to increasing the library's visibility and restoring its status as a central cultural and social destination. The new project is located at the corner, taking advantage of its exposure to the street, by using large transparent windows to establish a dialogue between the interior and the exterior, while also allowing plenty of natural light to enter. The walls have been thickened to contain quiet reading corners and private social spaces.

2.2. Massar Children's Discovery Centre and Library

Massar Children's Discovery Centre and Library is located in Damascus, Syria (Figure 2) [14]. The building includes exhibition, library, education and administrative spaces. The Discovery Center draws inspiration from the unique Damascus rose. The proposal proposes a shell structure that allows light to enter the center between rose petals. The design challenges the traditional horizontal movement of Arab cities and replaces it with the central vertical movement under the open sky. The project is divided into two parts which is built up area and Open Park. Inside the building, the skylight in the atrium resembles the complex inner spiral of a nautilus shell. It shows an interactive space, which extends into the non-linear discovery space, and then spirals outward at its edge to the

garden in the distance. The Massar Children's Discovery Center is a low-energy building using local materials, skills and resources. The curved shape of the building keeps the sun out, thereby passively reducing the energy load [14].



Figure 2. Massar Children's Discovery Centre and Library [14]

3. Space Program

The right location to build the library should be far away from the noise, disturbance and traffic congestion, and the building must be in a location that allowed natural lighting and ventilation [15, 16]. The appropriate size of the building is determined by predicting the minimum number of visitors to the library, and the number at peak times, in addition to the calculation of the total number of books to be placed in the library [16]. In this project, the main zones allocated for the space program are library, discovery center, entertainment zone, administration zone and skill zones [13, 14]. Table 1 tabulates the space program of each zone.

Table 1. Space assumption

Zones	Net area (m ²)	Percentage (%)	GFA (m ²)	Footprint (m ²)
Discovery center	1398	28.22	1678	839
Library	662	13.36	795	397.2
Administration zone	330	6.66	366	366
Skills zone	1030	20.79	1236	618
Entertainment zone	1534	30.97	1841	920.5
Total	4954	100	5916	3140.7

The library zone consists of the reading area, bookshelves, lounge, audio books, and study room. The discovery center zone comprises of workshops, laboratory experiments, spaceship 7D, smart board, and video game. The entertainment zone covers of classes,

smart board, smart game, hall, and gallery. The administration zone is made up of offices, copy center, lounge, clinic, and prayer room. Skills zone has a computer lab, classes, and workshops. The overall space program of the project is tabulated in Table 2. The overall built-up area for the project consumes of about 3140.7 m², which can accommodate 800 visitors.

Table 2. Overall space program

Contents	Area (m ²)
Built-up area	3140.7
Outdoor activity area	1256
Total land area	4396.7
Parking	500
Capacity	800

Besides that, several design criteria are considered for the development. The reading area should provide a good and comfortable lighting system that enables the reader to see the letters, symbols, and graphics in the book. The reading area should use light colors in the painting walls, ceilings, and in floor tiles, in the color of the furniture. Good furniture choices will provide comfort for library visitors, leading to long stays. The space of the corridors between the shelves must be up to 85 cm in the large libraries, while in the smaller libraries the distance between the shelves should be 77 cm. The design shelves for books with appropriate sizes, the length of the shelf must be 1 meter, and width of about 0.5 cm.

For the emergency stairs, the proper distribution of the stairs in every 25 meters should put an emergency staircase, in addition to the existence of fireboxes used in emergency situations such as fires. Also, choose an alarm system that works quickly in a fire, and install sprinklers on the outside of the building. The borrow counters should be arranged and organized in the loan department in a suitable manner that allows control of the loan and return, and must be about 90 cm long and 62 cm wide, where the visitor cannot see the contents in the interior. Besides that, design a corridor behind the borrow counter, to serve the staff working in the department.

Administration areas include offices for the library director, assistant library director, and information technology administrator, server room, staff break room, staff restrooms, staff circulation areas, and sufficient storage for library materials. Administrative activities also include work functions associated with general clerical office activities, customer service, materials ordering and processing, library operations planning and direction, and supervision of the facility and personnel. In addition, the lecture halls should be equipped with either fixed tables or fixed seating and movable chairs. Lecture hall shall contain about 50-150 seats.

4. Site Selection and Analysis

The site of the development must be in a lively area or educational community and easily accessible area. To choose the right site, each criterion is assigned a value called a weighting factor (WF), which used multiple factors when evaluating the selected site, where 1 = not very important, 2 = somewhat important, and 3 = Very important. The site with the highest score is chosen for the project.

The considered site evaluation criteria are site capacity, accessibility, noise levels, security and safety, visibility, location and surroundings, utilities, shape/ proportional and future development plans. The capacity of the site must be enough, including consideration of future expansion. The accessibility is very important to the project. Also, accessibility should be easy for the visitors to find the site. The site must be far enough from traffic, also (trucks and train) and noise from industrial or commercial enterprises. The location of the site is far away from the industrial area is to avoid bad air problems such as odor and dust. The site should be away from social hazards neighborhood, like the areas with high incidence of crimes. The site must facilitate good visibility of the project. The project should be clear for passers and not be hidden by big buildings like towers. The site should surround by many services, which will encourage the center. Also it is preferred to be located near educational center. The site must be located in a mixed-use area, so utilities are provided near the site. As far as the future development plan of the site is concerned, it measures the potential level of future development of the area adjacent to the candidate site, which will have an impact on the site. The sites with shapes almost rectangle in form are preferable as it is usually easiest to plan.

This study proposed two sites to be evaluated according to the site criteria, and each site is rated using a scale from 1 to 3, where 1 is very important, 2 is somewhat important, and 3 is not very important. The area calculated in this project is 5916m^2 (Gross floor Area), therefore the build-up area is 60%. Site 1 is located at the Al Naem district, Jeddah, Saudi Arabia, with an area of 18436m^2 (Figure 3). Site 1 is near to the Main Street which is Al Madinah Road, surrounded by three secondary streets. Site 2 is located at the Al Nahda district, Jeddah, Saudi Arabia, with an area of 15563m^2 (Figure 4). Site 2 is near to the Main Street which is a king Abdul Aziz Road, surrounded by three secondary streets. Table 3 tabulates the site evaluation result, where the evaluation scale is a range from 1 to 5 denoted by 'not fulfilled' to 'very well fulfilled'.



Figure 3. Site 1 [17]



Figure 4. Site 2 [18]

Table 3. Site evaluation result

Site criteria	WFs	Site 1	Site 2
Site capacity	3	6	12
Accessibility	2	6	8
Noise levels	2	4	4
Security and safety	3	6	6
Visibility	2	10	6
Location and surroundings	2	6	6
Utilities	2	4	4
Shape/ proportional	3	3	3
Future development plans	3	3	3
Total score		48	52

Site evaluation results according to Table 3, the higher score in the evaluation of the two sites is site 2, which is Al Nahda district, Jeddah, Saudi Arabia. Thus, Site 2 is selected for the project. Figure 5 shows the site accessibility analysis, where the site is near from Main Street which is king Abdul Aziz Road and surrounded by three secondary streets. Figure 6 illustrates that the site is surrounded by several landmarks such as Palagio Resort, Al Sheraa Land, Red Sea Mall, Al Yusor International School, Al Aiya International School and Happy Land.

Figure 7 illustrates the site climate analysis where the

site is exposed to northwest wind which is cool wind and southeast wind which is hot dusty wind. The wind speed at the chosen site is between 20-25 km/h. The maximum temperature in Jeddah in June is about 40 °C and minimum in January is about 15 °C. The annual relative humidity ranges on the site is from 30% to 89%, while the yearly rainfall is less but increases in September. Figure 8 demonstrates the site experienced low noise from the surrounding, but medium noise from the south. In addition, there is no view surrounding the site, but the view is not important for the project.



Figure 5. Site accessibility

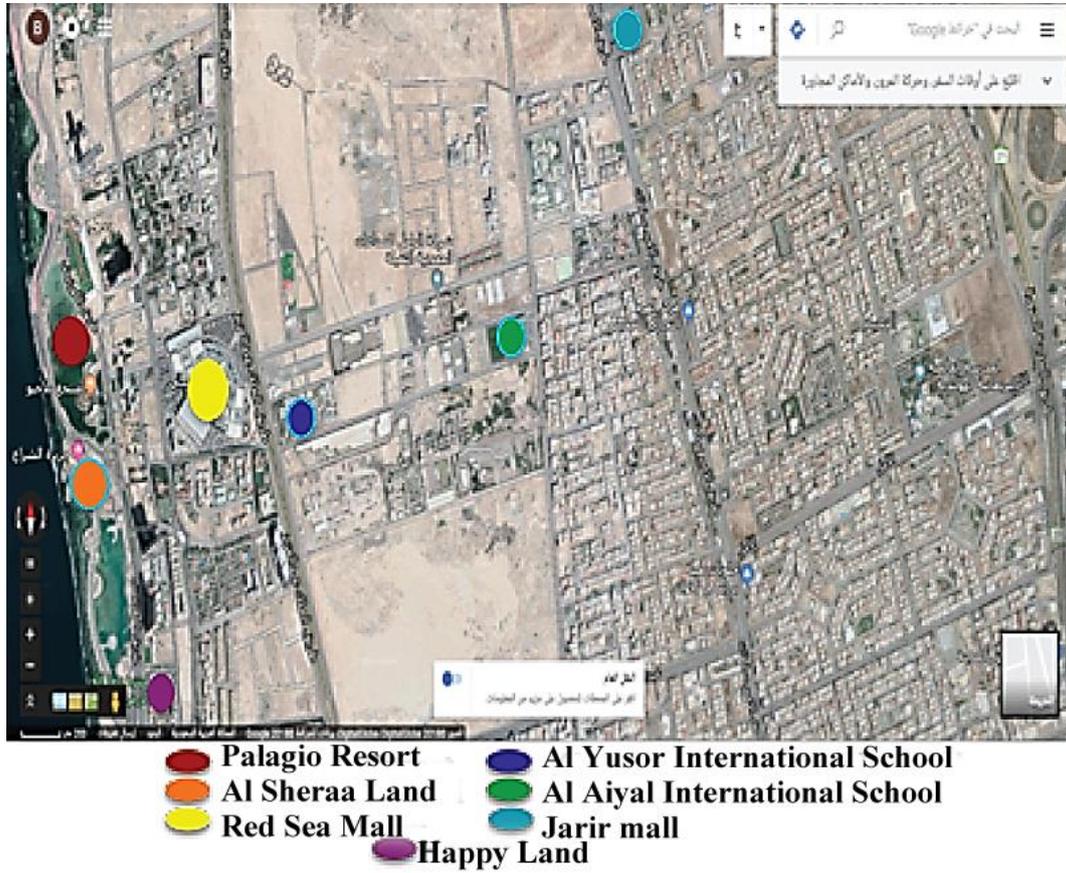


Figure 6. Site surrounding

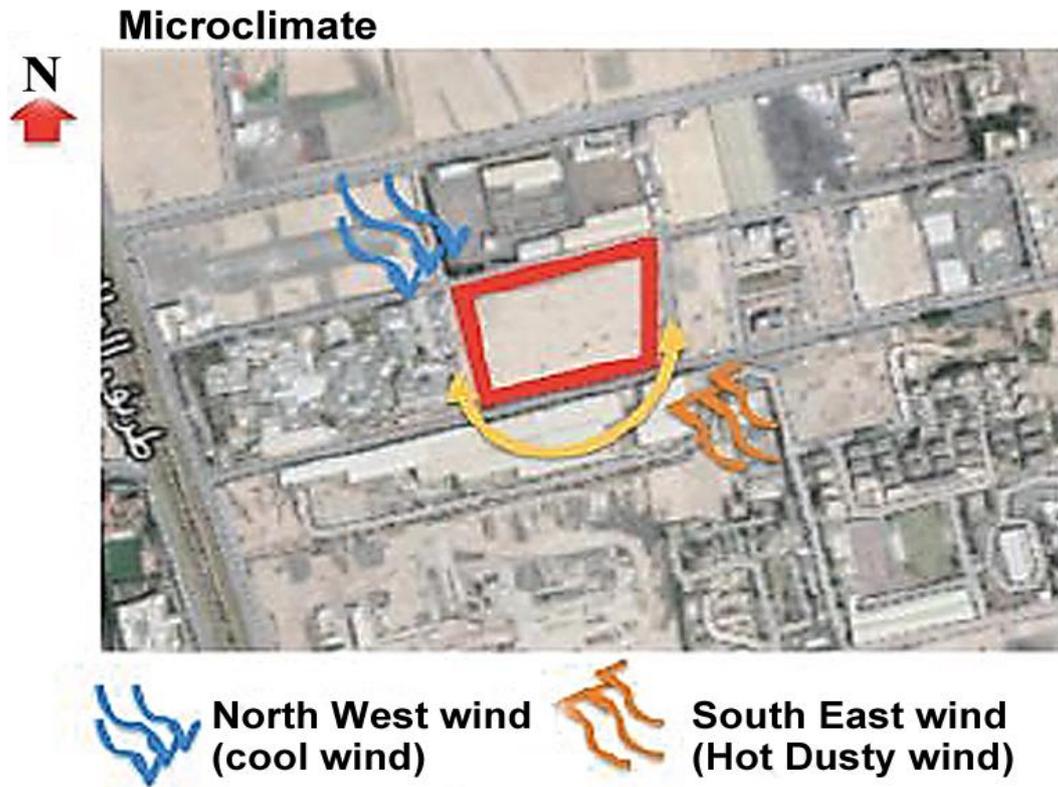


Figure 7. Climate analysis



Figure 8. Noise level at the site

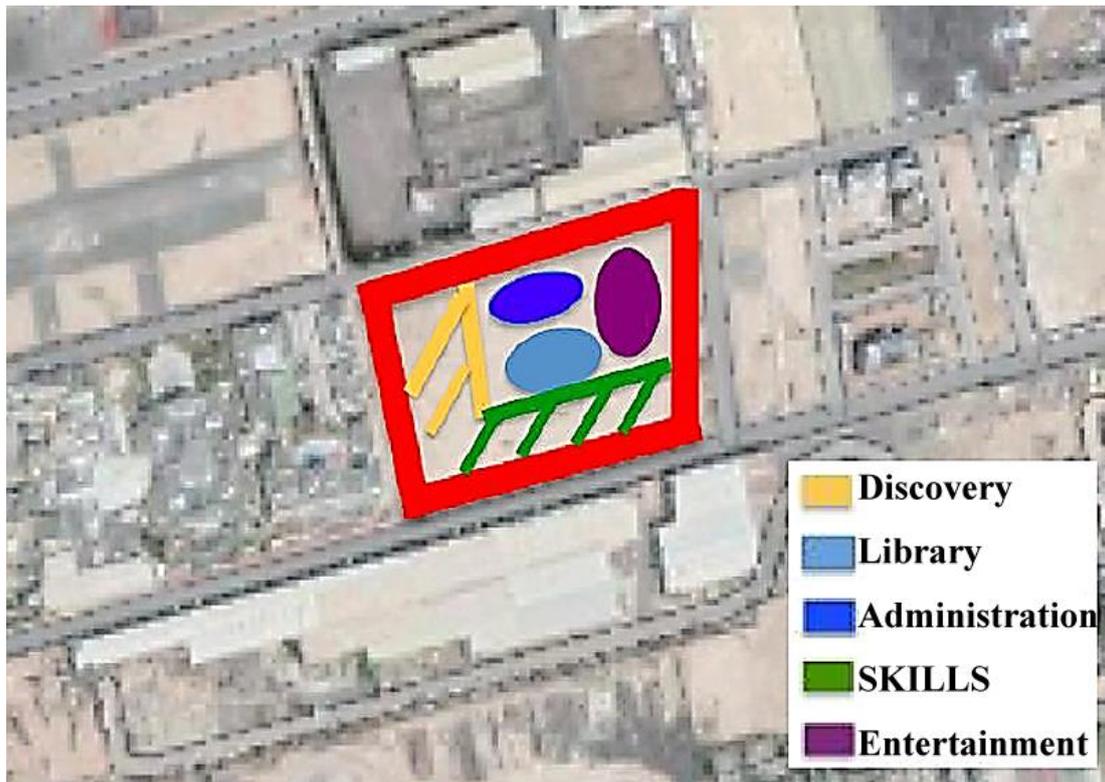


Figure 9. Site zoning diagram

5. Zoning and Project Design

This project designs the Entertainment and Education building for the children by providing educational and cultural resources for the kids, also developing their reading, research and creativity skills through different programs and activities. The site is located between two international schools, providing convenience for users, especially students.

Figure 9 demonstrated the site zoning diagram. The zoning of the project was allocated carefully where the administration zone is positioned close to the main entry and the library is situated at the middle of the site surrounded by others zones such as discovery center, skills zone, and entertainment zone. The advantage of the library being located in the middle of the area and surrounded by other buildings is that it creates a quiet and peaceful environment free from traffic noise and some industrial noise.

6. Conclusion

This project aims to build a big space to develop the knowledge and the education for children. The project provides educational and cultural resources for the kids in order to develop their reading, research and creativity skills through different programs and activities. The planned space program for the project is made up of discovery centers, library, administration zone, skills zone, and entertainment zone. The chosen site location is sited at Al Nahda district, Jeddah, Saudi Arabia, which is according to the site evaluation criteria of site capacity, accessibility, noise levels, security and safety, visibility, location and surroundings, utilities, shape/ proportional and future development plans. Children's library is a very important project, which provides facilities and environment to educate the kids a lot of skills and spreading culture. Also, this project is aligned with Saudi vision 2030.

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