



Project for Wildlife and Ecosystem Learning Space Design Using Multimedia, Bangkok

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Abstract

This research aims to design a multimedia space for learning physical characteristics and ecosystems of reserved wild animals and protected wild animals of Thailand to encourage awareness of preservation and conservation in humans. Theoretical information, concepts related to learning space with multimedia usage, and data related to wildlife and ecosystems are gathered to create factors for design guidelines. This research raises the quality standard of learning resource management. It is found that reserved wild animals and protected wild animals cover mammals, birds, reptiles, amphibians, insects, fish, and invertebrates. Different wildlife species live in different ecosystems such as terrestrial ecosystem, semi-terrestrial ecosystem, and aquatic ecosystem which are the natural habitats of the original local wildlife. However, the existing studies of wildlife at this present moment are still about displaying animals outside their original habitats which affect wildlife and the ecosystem. Moreover, the zoo changes in the future (tend to design the learning space as the conservation leader and wildlife learning resources. The hypotheses are can and how learning space is designed by excluding real animals and including multimedia technology to encourage awareness of wildlife preservation and conservation in humans. The research shows that the influence of multimedia on education has been increasing. It can enhance learning capacity, create experiences, and be used along with activities that support the learning environment. 7 Modes of the design innovation process and 9 components of Business Model Generation are used for the space design to create a deep understanding of wildlife and ecosystems for sustainable learning. This is the process of the studio for innovation creation called ENO Method which is applied to create stability for this wildlife and ecosystem learning center project. This learning space can encourage awareness of wildlife and ecosystem preservation and conservation since the users understand problems related to wildlife. Space is also for recreation, human interaction, and family activities.

Keywords: *Learning area, Multimedia, Public building, Innovation.*

1. Introduction

The project for wildlife and ecosystem learning center design using multimedia is a design project for the learning space of reserved wild animals and protected wild animals of Thailand. The project aims to encourage wildlife awareness and conservation in humans and also decrease animal displaying outside their original habitat which affects wildlife and ecosystems.

Nowadays, reserved wild animals are divided into 19 types. Protected wild animals are divided into 201 types of mammals, 952 types of birds, 91 types of reptiles, 12 types of amphibians, 14 types of fish, 20 types of insects, and 12 types of invertebrates. Different wildlife species live in different ecosystems such as terrestrial ecosystem, semi-terrestrial ecosystem, and aquatic ecosystem. Wildlife is beneficial for mankind and other natural resources and creates sustainable ecosystems. However, since its benefits are indirect rather than direct, the value of wildlife is abandoned including wildlife animal trade, ornaments from wildlife, recreation activities, and spiritual purposes. Therefore, the project for wildlife and ecosystem learning center design using multimedia proposes the tendencies of zoo changes in the future by using multimedia technology for the presentation as one of the new ideas for zoo visiting.

The idea of multimedia adaptation with learning space design will help present the information in an easy-to-understand way, offer sensory, create experiences, and increase learning capacities to better understand the value of wildlife and ecosystem and threatening factors that affect the wildlife extinction risk. The case studies are Ozeaneum, a public aquarium park in Stralsund, Germany (McManus, 2020), and learning space formats using multimedia of Museum Siam, Thailand.



2. Objectives

- 1) To study and design learning space using multimedia and activities which enhance understanding
- 2) To study the designs to raise awareness of the care and conservation of wildlife in humans

3. Materials and Methods

From Figure 1, The process called “ENO Method” (Bunyavipakul, 2019) was used. The researcher employed the framework in the part of creating innovation and business to be applied such as 7 Modes, Business Model Canvas, and Sprint process to create the customer-centric mindset with the architectural design process. The process was as follows.

This research is related to learning space design using multimedia. The methodology is as follows.

3.1 Study case studies and theories related to learning center space design

3.2 Gather qualitative data

- 3.2.1 Study data related to reserved wild animals, protected wild animals, and ecosystems of wildlife
- 3.2.2 Study multimedia space design formats
- 3.2.3 Study learning space design
- 3.2.4 Gather opinions (on appropriate learning media)

3.3 Analyze the data related to physical characteristics of wildlife and appropriate usage of various multimedia types

3.4 Find the background with 7 Modes (Kumar, 2014)

3.5 Study user behaviors and project value with Business Model Canvas (Strategyzer, 2018)

3.6 Conclude the program for the project space. Design the study space with design principles and multimedia usage and activity areas that encourage awareness of wildlife preservation and conservation.

4. Results and Discussion

4.1 Results

From the case study of OZEANEUM aquarium park in Germany (designyoutrust, 2008), it was found that spaces, shapes, and forms in the OZEANEUM aquarium park are designed following the conceptual expression and continuity by using curves, which creates a wider and more fascinating viewpoint (see Figure 2).

From behavior studies and opinion gathering from people on multimedia usage for exhibition creation in Museum, Thailand (Nukongsin, 2017), it was found that multimedia that has an impact on the satisfaction of the users are the media that the users can touch and interact with, media with computer-aided creation, simulation media, games, object media, and animated media, respectively.

The project is located on Sukhapiban 2 Road, Dokmai Sub-district, Prawet District, Bangkok, adjacent to PTT Green in the City Project. Since the purposes of the PTT Green in the City Project are to increase green areas and connect urban population with forest, the ecosystems will be more completed if the wildlife is added to the project. Plus, the policy and the network of PTT that support learning innovations will provide more stability to the project.

The design and accessibility of the project are referred to in its adjacent contexts to create the connection between the wildlife learning center and PTT Green in the City Project (see Figure 3).

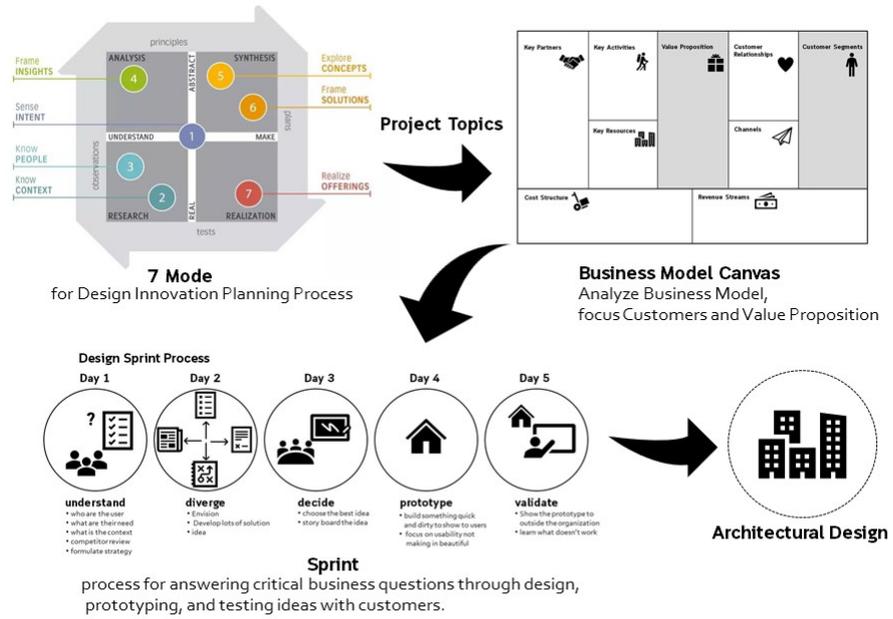


Figure 1 ENO Studio Method

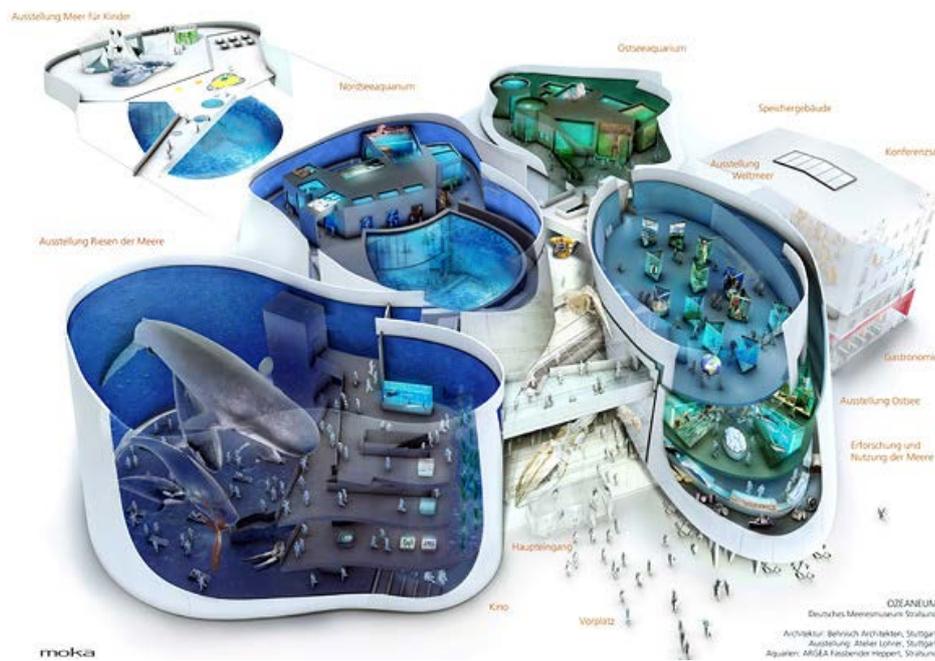


Figure 2 Layout arrangement and building shape usage



Figure 3 Connection of adjacent contexts

The design of the spaces in the project begins from the zone adjacent to the PTT Green in the City Project, which reflects the concepts (Figure 4) and respective connections for better understanding. The walking route is divided into 3 routes: 1) the route displaying the concepts of the project, 2) the route connecting directly to the PTT Green in the City Project, and 3) the route of other supporting zones. The walking pattern is not fixed. There are 2 entrances (concepts): zone A and zone H. All walking routes are mainly slopes, similar to wandering in the forest. Basic facilities are still be provided in other functional zones of the project. If the users walk from zone A to zone H, the route will begin on the first floor to the third floor, then to the second floor, and going back to the first floor, respectively. If the users start from zone H, the route will begin from the second floor to the third floor and then going down to the first floor (Figure 5).



Figure 4 Concepts of the project divided by physical characteristics and habitats of wildlife

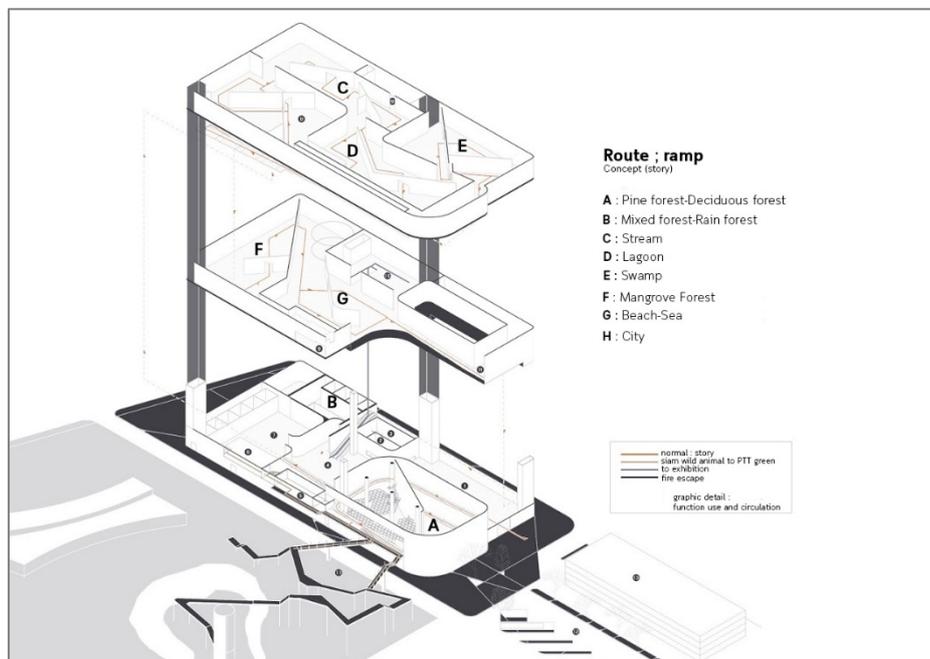


Figure 5 Routes in the project

Conceptual space design and viewpoint creation for better perception along with proper multimedia technology selection to stimulate the user interest are carried out by using diagonals to divide each space to create a wide viewpoint, grouping different media, ordering accessibility of each zone, and interior design according to each ecosystem (Figure 6).

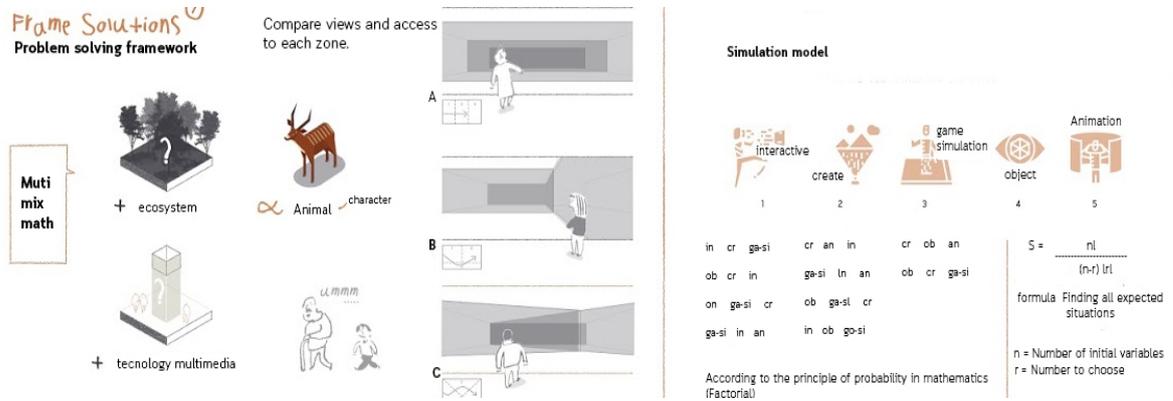


Figure 6 Concepts of interior space division and multimedia technology grouping

Hall (first impression) is the starting point of the project. The combination of wildlife and multimedia technology is used to create new viewpoints and perceptions (Figure 7). Next, Zone A is the first zone that expresses the concepts of the project. This zone has connections to the PTT Green in the City Project and also within the ecosystem. Models and media technology are used for the media design of this zone to create interest (Figure 8). The media in zone B is designed from the shapes of wildlife to create a new and fascinating vision (Figure 9). The media design in zone C is derived from ecosystems to create shapes for better perception (Figure 10).



Figure 7 Hall (area first impression)



Figure 8 zone A



Figure 9 zone B



Figure 10 zone C

In zone D, the media is designed in gaming form to stimulate interest and specific wildlife in each ecosystem is used (Figure 11). In zone H, the last zone expressing the concepts of the project, slopes are



applied to all areas, leading back to the first floor. Animated media is used to create a realistic feeling. All components can stimulate sensory, including ceiling and walking paths (Figure 12).



Figure 11 zone D



Figure 12 zone H

In terms of the building envelope, harmony and stories related to nature are used to create the façade to create the connection with the PTT Green in the City Project. [1] The forest first circulates the air, [2] the air is evaporated by the sun, [3] then condenses into the cloud, and [4] falls like the rain into the sea (Figure 13).

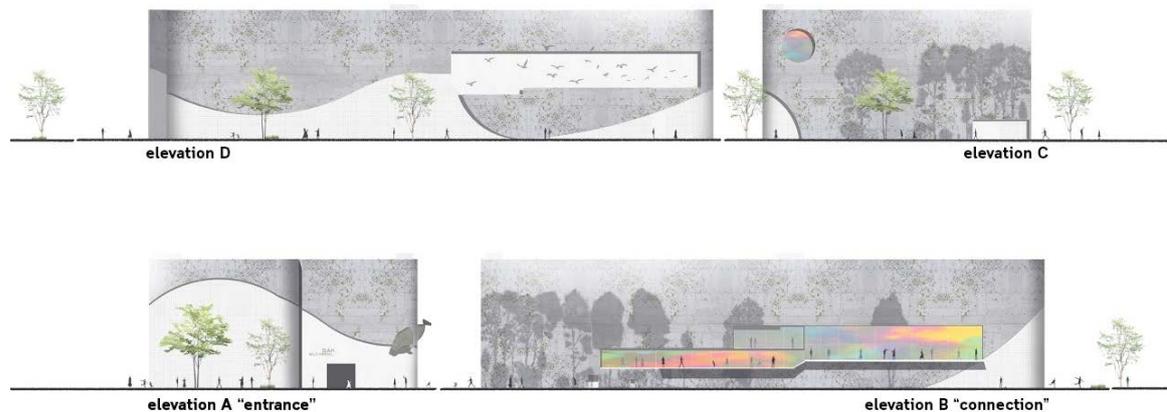


Figure 13 elevation A-D

4.2 Discussion

From the results of the research on wildlife and ecosystem learning center design in Bangkok, the design is based on the principles of learning space design development and the principles of universal design for all ages. The design focuses on giving fascinating viewpoints and stimulating learning by using multimedia technology to provide knowledge and enhance the right understanding of the nature of wildlife. Overall components and the formats of the project are designed according to the results of behavior and opinion analysis of the users on multimedia usage for exhibition creation in museums. The results of the design for each zone are as follows:

Public space shall be universally designed so people of all ages are able to access and use it. The space accessibility format for each function is necessary to be considered. Steps or facilities such as escalators or elevators shall not be applied excessively since the zone will be inaccessible if the facilities experience any technical problem. Space shall also be designed to predominantly support various groups of users.

On learning center design, apart from the concepts of the project that are the selling point, the accessibility and the consequent storytelling shall also be focused on. They will help the users to understand

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the information in a more enjoyable way. If the walking routes of the users are firstly designed to cover all areas of the project, the functional zone planning will be easier.

Considering learning center design using multimedia technology, apart from the technological limit, creating dimensional and new viewpoints will stimulate user interest. Connecting areas within each zone and using various components to create mysterious feelings all the time will create a sense of flowing of the project and joy of learning.

The results of design for each zone are from the same story of nature combining with space design principles using multimedia technology to create new forms for learning spaces. The project will lead to activities which stimulate learning and encourage human awareness of wildlife preservation and conservation without displaying wildlife outside its original habitats and decrease the disparity between human and wildlife by using technology as the medium between human and animals for modern learning guidelines.

Five professional architects have given 4.72 points out of 5 points, which is a good score. Further comments from a social network via the website Siam wild animal education center (<https://sites.google.com/rsu.ac.th/siamwildanimaleducationcenter/home>) are also gathered for further project development in the future.

5. Conclusion

The project for wildlife and ecosystem learning center using multimedia technology for encouraging awareness of wildlife preservation and conservation is the new style of learning space design that uses multimedia technology and behavior and opinion analysis of the users. The principles of the learning space design are applied along with universal public space design for people of all genders and all ages to meet the objectives of designing a learning area by using multimedia materials and activities that promote understanding. The researcher found the analysis and design of the project through the sequencing model, bringing the story to create a connection between the concept and the surrounding context and make the users aware of the vision of the project. It is a learning area that can promote awareness of helping and preserving wildlife and ecosystems as the users will understand the situation and problems that arise among the wildlife. It is also a fun area, Interaction space, which is also a family activity area for promoting human consciousness in wildlife preservation and conservation.

6. Acknowledgements

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