Wayfinding in Theme Parks

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***Abstract*—This paper aim to examine the complexity human wayfinding process in theme parks pertaining to architectural built environment. As a measure architectural factors like site planning, path configuration, nodes, landmarks and legilbity are studied in chosen theme parks. The present study is undertaken at Wonderla Amusement Park in Kochi, Dream World Water Theme Park in Athirappilly and Silver Storm Water Theme Park in Athirappilly. Also literature studies were undertaken in Disney World Magic Kingdom in Florida, Universal Studios in Singapore and Epcot Theme Park in Florida. A key finding indicates that the configuration of circulation path and the spatial organization in relation to the path plays a major role in the experience of the visitor. Outcomes from this study will benefit designers, policy makers and theme park managers to plan or manage wayfinding system in theme park for conveniences.**

Keywords*— *Wayfinding, theme parks, site planning, paths, nodes, landmarks, legibility

I. INTRODUCTION

People do wayfinding throughout their lives. They navigate from place to place, relying on knowledge that is mediated by structures and categories of understanding people's daily experiences in the space they live [7]. Wayfinding is a natural skill that people learn as small children [4] and develop as they grow up. It takes place in many different situations, such as driving across a country, walking in a city, or moving through a building [6].

Much research has explored the issues of wayfinding in unfamiliar locations, such as airports, shopping malls, galleries etc, and also on urbanization which had been discussed widely [5] but less research concerned on the pattern of wayfinding related to spatial layout in the theme park. Theme park wayfinding process includes the selection and identification their own route and path inside the park. Whoever has experienced getting lost will feel unpleasant especially for those are the first time visitor [3].

Data was elicited from observational studies conducted in chosen theme parks. The objective of the research, firstly, is to examine the spatial organizational aspects which impacts the wayfinding in the site planning level. Secondly, to study the effect of character of approach, entrance and paths on the wayfinding process in theme park. Thirdly, to study the major nodes which act as decision making points in wayfinding. Fourthly, to locate and examine the architectural character of the major landmarks which become the important components of cognitive maps. Fifthly, to understand the legibility of the built environment based on visual aids like signage, maps, etc.

II. LITERATURE REVIEW

Wayfinding is described as a complex process and always been referred as a reaction to the environment depending the visit is either pre-planned or unplanned [3]. Some visitors have prior knowledge before they refer to landmarks [1]. According to Passini [9][10] wayfinding is the cognitive ability to assimilate spatial information, make maps find one's way, make decisions and execute the three decisions: cognitive mapping, decision-making and decision execution. Wayfinding also flows psychological patterns based on visual perception. Montello [8] identifies that wayfinding can be defined as the decision-making process that made the individual navigate on their own way. To improve the functionality of the environment, Brandon [2] emphasizes the process of wayfinding is part of understanding memory, cognitive mapping and spatial recognition. Many researchers sought that the patterns of cognitive and mind mapping is related to human emotions and movements [3].

A. Human Wayfinding Behaviour

Kevin Lynch's [17] The Image of the City is regarded as the foundation for human wayfinding research. Based on his investigations Lynch divided the contents of the city images into paths, edges (boundaries), regions, nodes, and landmarks. Weisman [20] identified four classes of environmental variables that influence wayfinding performance within built environments: (I) visual access, (2) the degree of architectural differentiation, (3) the use of signs and room numbers to provide identification or directional information, and (4) plan configuration.. Garling et aL [11] proposed to classify the environment by examining the degree of differentiation, the degree of visual access, and the complexity of spatial layout. Cornell et aL [15] tested people s accuracy of place recognition and used the results to develop a model of wayfinding.

B. Wayfinding in Theme Parks

Visitors' movement becomes an issue in leisure park but how they can reach their destination at ease without being confused or worried about being losing track. Any visitor who at the first occasion will take their time to enjoy and get familiarize to find their way and may not realize how confusing and difficult to reach the destination [3]. By navigating the surrounding and using elements such as paths, nodes, landmarks, signage, spatial organization, sound, colour, etc. they can easily follow the best route to their destination.

They are a few examples that patterns can be extracted from visitor's movement in a theme park. They could be categorized in three movements: axis, looping and thoroughfare as shown in Figures 1, 2 and 3 [3].

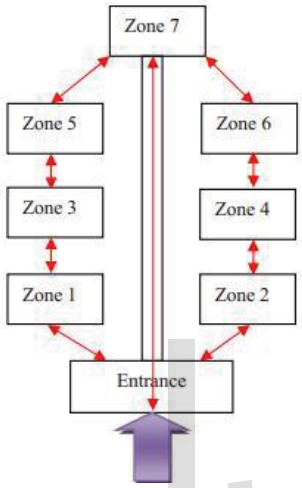

Fig. 1. An example of thoroughfare movement

Figure 1 shows a place of passage from one location to another. The pattern of this pedestrian provides clearly to identify entrances. Circulation pathways can cross thoroughfare, providing individual intersections to each playing zone. Examples of theme parks that been practiced using this movement are: 1) Sesame Place Bucks County in Pennsylvania and 2) Six Flag La Roude in Montreal [3].

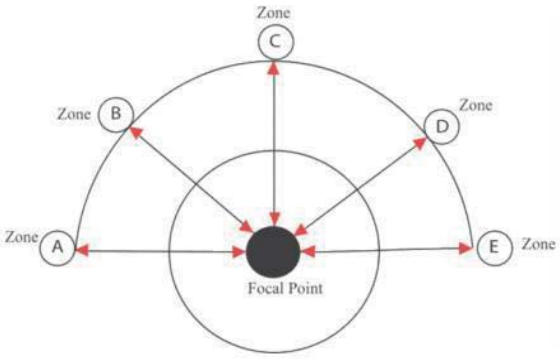

Fig. 2. An example of the loop movement

In Figure 2, the purpose to combine themed lands that separated is to avoid visitors from getting lost. It improves circulation and the events distribution of visitors. The Loop Plan is yet another basic circulation plan. The Loop plan is commonly found in Universal Studios theme parks, such as Universal Studios Islands of Adventure and Universal Studios Singapore. Modified versions of the Loop are also at many other parks. The plan is simple: the entire circulatory system is made up of a single walkway loop that passes in front of most major attractions [3].

The Loop indicates either large pond or open space be placed in the center of the park, as the main focal point. The loop walkway provides an existing viewing area that can accommodate a large group of visitors. The themes of the lands remain separate, and visitors have no trouble finding their way. Examples of theme parks that been practiced using this movement: 1) Universal Studio in USA. 2) Universal Studio in Singapore. 3) Alton Towers Theme Park in United Kingdom. 4) Disneyland Anaheim in California.

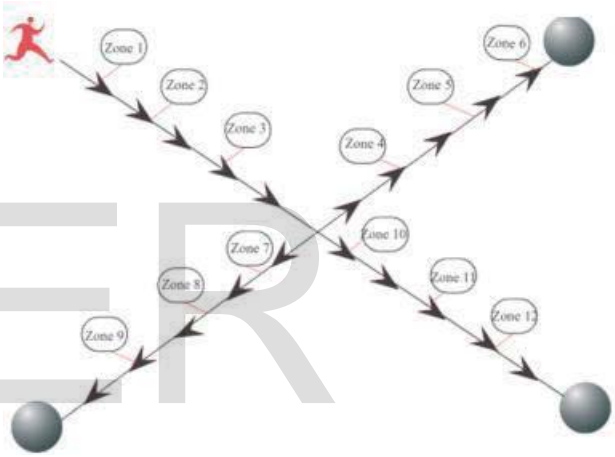

Fig. 3. An example of the axis movement

From Figure 3, the Axis formations provides an escalating or point to point pattern. Visitors will not be able to miss any zones areas provision. They have a controlled movement and a midsection meeting point. The information-gathering and decision-making processes visitors used to orient themselves and move through space; how people get from one place to another. Humans make decisions as they move through a space, and that depends on information signages and clues received as they move. First, we access what we are viewing upon reaching on site. Second, interpret the visual and written information what we saw. Thirdly, is to make decisions based on what we observed, move ahead in real time and repeat these steps until found the destination [3].

Most decisions in wayfinding are based on information on architectural elements such as entrances to the building, transition points one zone to another, exits, path and stairs.

Components such as colour, textures are part of navigation and rotations in wayfinding. Examples of theme parks that been practiced using this movement: 1) Movie World, Warner Bros. Australia, 2) Universal Studio Japan, 3) Flamingo Land, North Yorkshire, England [3].

III. METHOD

Case studies were done to understand the role of built environment in wayfinding processes undergone in theme parks. Different architectural factors which affect wayfinding were analyzed in the chosen theme parks and then compared. The factors are as followed:

- Site
  - Planning
  - Spatial Organization
- Paths
  - Approach
  - Entrance
  - Configuration of Path
  - Path-Space Relationship
  - Form of Circulation Path
- Nodes
- Landmarks
  - Architectural Character
  - Colour
  - Texture
  - Scale
  - Position
- Legibility
  - Signage
  - Maps
  - Visibility

IV. CASE STUDIES

The present study is undertaken at Wonderla Amusement Park in Kochi, Dream World Water Theme Park in Athirappilly and Silver Storm Water Theme Park in Athirappilly. Also literature were undertaken in Disney World Magic Kingdom in Florida, Universal Studios in Singapore and Epcot Theme Park in Florida.

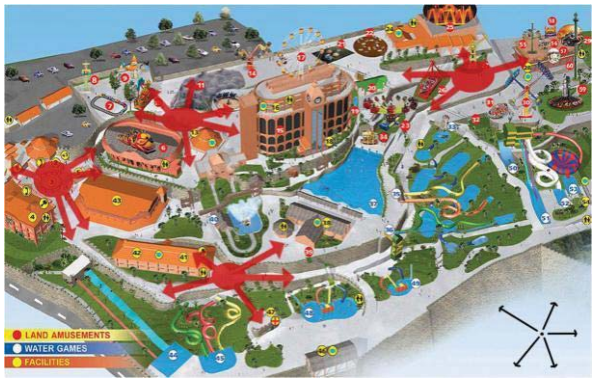

Fig 4. Radial Configuration of Paths at Wonderla, Kochi

Wonderla (formerly Veega Land) is an amusement park designed by architect Joseph John and operated by Wonderla Holidays Limited Company and located at Pallikara, Kochi. Opened in 2000 and spread over an area of 82 acres. It lent a new dimension to tourism in Kerala. Built on the slope of a lush green hill, this beautiful park which crossed the 1 Crore visitor mark this year, has 54 land, sky, water kids rides is built to international standards and maintenance.

Dream World water theme park is situated close to the Athirappilly waterfalls in Thrissur district of Kerala. The park is designed in such a way that tourists belonging to any age group can effortlessly reach all the amusement rides without much walking or climbing. Since it is a water park, out of 42 rides in the park, 24 rides are water based.

Fig 5. Clustered organization of spaces at Dream World

The Silver Storm Water Theme Park is located 19 km from Chalakkudi in Thrissur district of Kerala. There are water rides , dry rides and also a Chinese village in the park. Silver Storm Amusement Park is run by a group of enterprising NRIs, launched with financial assistance from the Kerala State Industrial Development Corporation Ltd. (KSIDC). The first phase of the park was launched on August 5, 2000. The park was expanded in later years, reaching its fifth phase in April, 2005.

Magic Kingdom Park is the first-built of the four theme parks at the Walt Disney World Resort in Bay Lake, Florida. It opened on October 1, 1971. Designed and built by Walt Disney Enterprises, and is dedicated to fairy tales and Disney characters. In 2013, the park hosted 18.58 million visitors, making it the most visited theme park in the world for the fifth consecutive year. The park is represented by Cinderella Castle, a replica of the fairytale castle seen in the 1950 film.

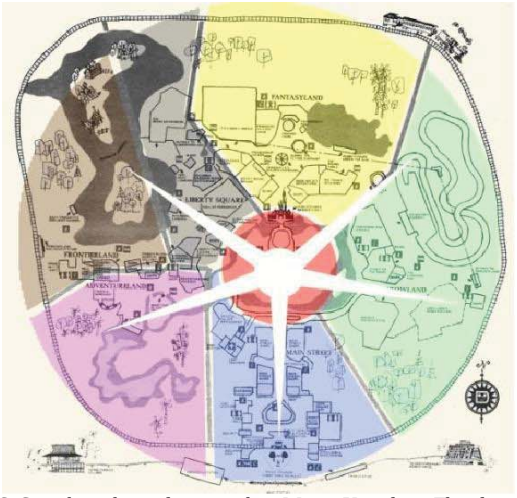

Fig 6. Star shaped circulation path at Magic Kingdom, Florida

Universal Studios Singapore is a theme park located within Resorts World Sentosa on Sentosa Island, Singapore. It is the second Universal Studios theme park to open in Asia and the first in Southeast Asia. It is 20 hectares (49 acres) in size. There is a total of 24 attractions of which consists of 7 themed zones. The grand opening of this theme park was held on 28 May 2011.

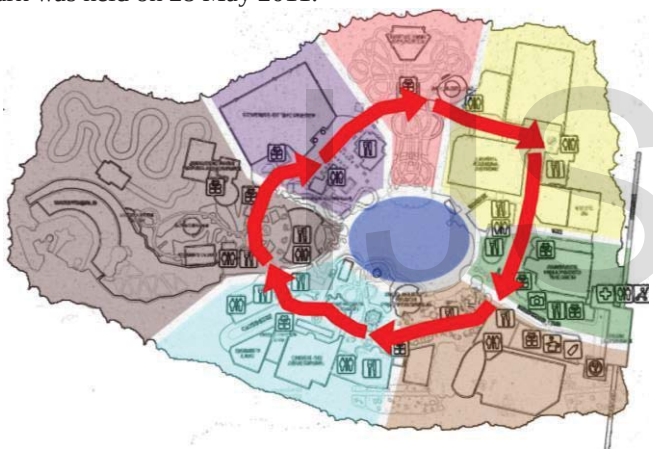

Fig 7. Loop shaped circulation plan at Universal Studios, Singapore

Epcot is the second of four theme parks built at Walt Disney World in Bay Lake, Florida. It opened as EPCOT Center on October 1, 1982, and spans 300 acres (120 ha), more than twice the size of the Magic Kingdom park. It is dedicated to the celebration of human achievement, namely technological innovation and international culture, and is often referred to as a "Permanent World's Fair." The park is represented by Spaceship Earth, a geodesic sphere that also serves as an attraction.

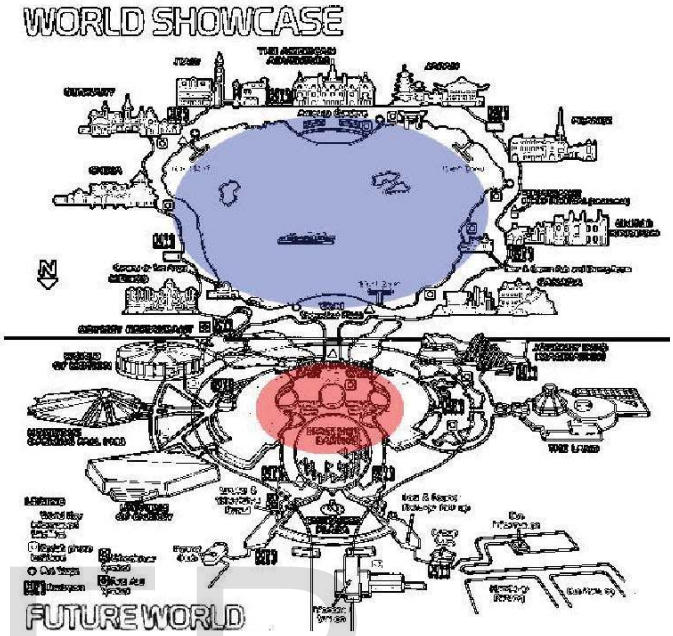

Fig 8. Combination of two centralized organizations at Epcot, Florida

V. CASE STUY ANALYSIS

	WONDERLA KOCHI	DREAM WORLD	SILVER STORM	MAGIC KINGDOM	UNIVERSAL STUDIOS	EPCOT
Planning	Based on topography	Every ride accessible without much walking or climbing.	Linear, dry rides near entrance and wet rides towards rear	Six themed lands	Seven themed zones	Two themed areas Future World and World Showcase

Spatial Organization	Adjacent spaces	Clustered organization	Linear organization	Centralised organization	Centralised organization	Combination of two centralised organization
Approach	Spiral	Frontal	Oblique	Frontal	Frontal	Frontal
Entrance	Hidden	Elaborate, articulated, perpendicular to the path of approach, recessed, central location	Contrasting the form and character of place, perpendicular to the path of approach	Signifies pillars and overhead beams, perpendicular to the path of approach	Signifies pillars and overhead beams, change in threshold, perpendicular to the path of approach	Entrance leads to entrance plaza, then move in any direction
Configuration of Path	Radial	Composite, branching	Linear	Star plan	Loop plan	Combo Plan, Combination of Loop and Wheel
Path-Space Relationship	Pass-by spaces	Pass-by spaces	Pass-by spaces	Pass through spaces, terminates at central hub	Pass-by spaces, loop around large water body in centre	Pass-by spaces, integrity of each space is maintained
Form of Circulation Path	Narrow path, enlarged by merging spaces	Narrow open path	Narrow open path	Trams, monorail, buses, ferryboats	Different forms, Hollywood theme land lined with palm trees and replicating 'Walk of Fame', New York theme land features and classic landmarks	Narrow path encouraging forward motion, enlarged by merging spaces, path in a large space so random
Nodes	Point in 3 to 5 directions, decision making points	Decision making points	Landscape features (land marks), decision making points	Central plaza, pointing to five directions	Intersection of the single walkway loop with entrances to different theme lands	Entrance plaza, intersection of Future World and World Showcase
Architectural Character	Rhythmic windows, medieval architecture style	Medieval architecture style, imagery of castle	Fairytale land style	Fantasy land	Universal Globe, Far Far Away Castle shows fictional palace, Battlestar Galactica rollercoaster shows metropolis of future	Spaceship Earth is a sphere, supported by three pairs of legs.

Colour and Texture	Lateritic stone	Colourful	Colourful	Marble, colour scheme of white, brown, pink	Far Far Away Castle has beige coloured walls and brown tiled roof, Battlestar Galactica is a red and blue roller coaster with white posts	White structure, on a closer look cladded with triangular tiles, derivative of pentakis dodeca hedron
Scale	Large	Huge	Large	Large, strong image	Imposing, Battlestar Galactica rollercoaster at a height of 42.7 metres	Large, 18 storeys high
Position	High on the crest of hill	At the entrance, front end of the site	Along the visual axis from the entrance, parallel to the path of approach	Central, along a strong visual axis	Universal Globe is placed at the entrance , Castle and rollercoaster located on opposite sides of the lagoon,	Entrance to theme park, strong visual axis
Signage	Wooden- ride specifications blue- other facility red- warnings	Inadequate, no uniformity, less visibility	Enough signage for ride specification, less signage to show direction, too many destination in single signage	Directional signage, verbal, information centers, layout maps, signage for visually impaired	Signage that resembling the character of the theme land, Warnings shown on movie clapperboard	Uniform pattern, different signage for each country pavilions
Maps	Six you-are-here maps	No maps are provided	No maps are provided	Guide maps, GPS systems	Guide maps, separate colours for different theme lands	Guide maps to maintain orientation and sense of location
Visibility	High due to sloping site	Less , exceptions are tall buildings	Less , revealed in parts as one proceeds through the linear path	High from central plaza	High from central lagoon, presence of large void	High from central lagoon, presence of large void, Paths intersect at right angles and straight

Table 1. Comparative analysis of case studies

VI. INFERENCES AND RESULTS

The methodology and findings were used to develop a framework system to see the relationship between wayfinding process and the built environment. Table 1 illustrates comparative study summary.

The site planning should be properly segregated and in relation with the topography so that it can be easily comprehended. Spatial organizations should be based on the themes and circulation pattern.

Approaches and entrances can be hidden to bring in surprise or can be axial to create strong visual axis. Configuration of paths can complement the spatial organization and topography to avoid confusion. Path-space relationship should be such that the visitor pass-by the spaces which he /she walks through the path and also the spaces terminate at the end of the path. Form of circulation space is commonly found to be narrow, open paths.

Nodes are to designed and placed at major design making points, with a maximum number of choices upto five. Landmarks form major components of cognitive maps. Architectural character of the landmark should be most imposing and should form the guideline for the design of the rest of the theme park. The scale of the landmark should be large in comparison with park and positioning can be on higher ground to increase the visibility.

To improve the legibilty of the park, proper signages using appropriate colours for ride specifications, facilities and warnings. You-are-here maps should be placed at different zones in the site to help visitors not loose orientation inside the park. Design of spaces can be transparent to increase visibility, rather than blocking views, to help the visitor know his location with respect to the park.

VII. CONCLUSION

This paper aimed to identify and analyze the complexity of wayfinding process for park users and the contribution of built environment to the complexity. My findings show that the configuration of the circulation path plays a major role in the experience of the visitor. Also landmarks tend to orient the visitors. Changes in architectural character and landscape features become major push and pull factors to different spaces for visitors.

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