

# Transforming user Experiences of Airport Terminal Building

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**Abstract—** Human beings are depended on one other, for trade, economy, growth, etc. Transportation is one of the sectors through which we can connect to the rest of the world. Hence transport plays an important part in Economic Growth, Travel and Globalization. There are different means of transport, and the fastest is air transport. Air transport is used for fast accessibility of goods, products, and increases tourism. Designing an airport according to function and need of Sustainability, sometimes we miss internal environment of the Airport which the users experience. Many Researchers Study Airport Structure, Sustainability, Function, Circulation, Management, etc. Airport internal Environment is also a very important aspect in Airport Design. This paper explains different concept and themes which are executed and is successful creation in last Decade. Through some Sample Case study, paper also try to conclude how design of an airport can promote local culture, material, Architecture, Nature and also how this all effects on Psychology of a passenger travelling through airport terminal and also giving an over view of internal Aura of Airport and how one can achieve it.

**Keyword –** *Comfort, Fun, Entertainment, Refreshment, Indoor landscape, destress.*

## I. INTRODUCTION

Designing an Airport is a difficult task, Area is difficult to design due to its complex functioning and structural pattern it includes international standards and Calculations, from this Terminal building plays a major role to serve the service and hospitality to the Travelers. Travelers can only access terminal building and parking area, landscape around the airport premises.

At the initial stage of air Transport development, a small terminal with Basic Necessaries were introduced. For passengers it was an uncomfortable and time-consuming process of Check-in. In this period Passengers don't have any facility to spent time in meanwhile of check-in and boarding the flight. As New development took place food items and some Necessary retails were added in terminal building like – Medical store, General Store, Some cultural and special gift shops.

Due to connecting flights, boarding and aviation time tourist or local passenger spend their time in terminal building. Tourist expect all facilities for comfort and fun in terminal between this time period for example – Entertainment zone, retail area, refreshing area, Indoor Garden, resting place – Rest rooms, Airlines waiting area, 24hr food court, etc.

Now a days many new concepts are introduced for theme-based airport Design. Many countries like Singapore, Philippines, Dubai and many more have Accepted this new Concept of Airport design. These airports are well functioned and ranks in top airport of World. In this concept-based airport, they have paid attention to the interior Aesthetics, Areas for

refreshments, Fun, Entertainment, etc. Where visitors and Passengers can spend their time and enjoy all the facilities of airport.

**What is theme-based Airport** – Airports with interior and exterior structure is inspired from one element. Concepts like – Jungle theme, Resort Theme, Infinity Theme, Future airport, local culture theme etc. are emerging in world, this airports interior and exterior is followed by the same theme and all structural parts like column, Roof, Ceiling, beam, and interior elements like Lights, Counters, Window, Door, Open space, etc. follow same theme.

**Sample – 1 Chhatrapati Shivaji Maharaj International Airport Mumbai, India.**



Figure 1 – CSMIT Column Deign

This airport is based on Peacock theme, Feather of peacock is used in all the elements like – Column, Roof, Lights, Jali, False ceiling, Landscape.

- Architect – SOM
- Site Area- 1,160 Hectors
- Criteria of selection – Theme based Indian Airport
- Location – Mumbai
- Annual Passenger – 45 Million
- Concept - India Culture and Indian Natural bird Peacock is the inspiration of this airport.

Figure 2 Landscape Design

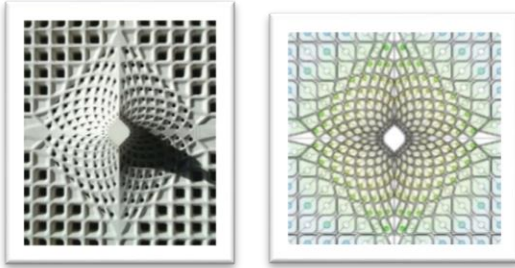


Figure 3 Roof and Column Design of ASMT Mumbai

The monumental Space created beneath the thirty mushrooming columns decision to mind the airy pavilions and interior courtyards of Ancient regional architecture. Once inside, Passenger enter a warm, light-filled chamber, covered underneath a long-span roof structure supported by an array of multi-story columns. The departure area for international and domestic passengers is on fourth floor, accessed from a sweeping elevated road. At the entrance are airport the lanes splits into different sections of car and bus for drop-off curbs with ample space for departure rituals as in Indian Culture. From the opposite side moment of arrival, the terminal embraces the passenger.



Figure 4 Front Curb Image with space to drop-off

Above, the cantilever roof extends to cover the entire arrivals roadway, protecting passengers and their guests from Mumbai's Atmosphere and unpredictable monsoon weather. A 50-foot-tall glass cable-stayed wall at the entrance allow the visitors to visualize the internal airport space. Small patterns of colourful glass recessed within the canopy's coffers speckle the hall below with light

### Indoor Landscape –/

In-between interval spaces indoor landscape is designed in such a beautiful way that passenger can sit and enjoy it. The Airport indoor Landscape has more than 150 species of local and exotic plants.

The colours inspire by peacock and traditional architecture, the national bird of India, and the symbol of the airport.



Figure 5 Inspiration of CSMIT 2 Mumbai

### Key Learning-

Inspired by Ancient Indian architecture and India National Bird SOM have merged the locality with new technology of Construction and gave a over view of all the states of India in the interior Walls of Airport. It was a difficult task to manage all this at the city centre. Indoor Landscaping Gave a liveliness in the indoors.



### Sample – 2 Resort Airport - Mactan Cebu International Airport T2, Philippines



Figure 6 – Mactan-Cebu International Airport T2

- Architect – Integrated Design Associates
- Site Area- 797 Hectors
- Criteria of selection – Theme based Airport
- Location – Mactan Cebu
- Annual Passenger – 12 Million
- Concept -Philippines is a tourist destination and lot of resorts. Cebuano culture and local construction techniques this airport is designed on.

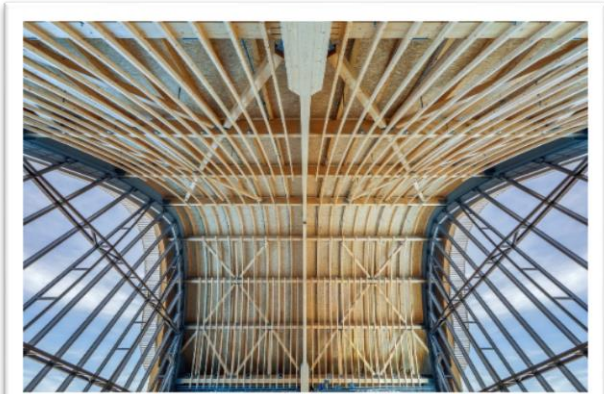
Philippines is a group of small islands and Cebu has always been at the spearhead of the Philippine tourism industry, and this airport is a primary gateway that connects travellers to top destinations in the nearby islands (and beyond). Even before the launch of Terminal 2, Mactan Cebu terminal 1 was the second-largest airport facility in the Philippines, with 10 million passengers passing through it last year.

Mactan-Cebu International Airport Terminal 2's design is inspired by **Cebuano culture**.



Figure 7 Mactan-Cebu International Airport T2 Staff

Cebu is an internationally well-known holiday destination. The new Mactan Cebu has lot of resort for tourists Terminal 2 is the gateway to those resorts in the region, and designed as a echo a **resort-like feel** while function as a transport interchange.



The large timber arches at the airport each span around 30mt is made from glue-laminated timber and are joined by thousands of smaller wooden ribs to form a skeletal structure.

Construction Techniques of timber was a local Construction technique and material.



Figure 9 Wooden Arches Work Frame.



Figure 13 Terminal and Jewel Location

Figure 10 Large wooden Arches.



Figure 12 Interior landscape and Wooden wall and false ceiling



Figure 11 Wooden arches with Large Blue Glass Window

### Key Learning-

Local material, Culture, Architecture, Geography, Nature is beautifully expressed through one structure.

### Sample – 3 Changi International Airport, Singapore.

- Architect – Moshe Safdie.
- Site Area- 1,300 Hectors
- Criteria of selection - Facility for Passengers.
- Location – Singapore



- Annual Passenger – 90 Million
- Concept - Singapore is Called Garden city to respond this a lot of indoor Vegetation in terminal and Jewel a indoor jungle is design.

Changi International airport have got World's best Airport for passengers, Architect Safdie Have said "This airport is not only a gateway to your destination but it's in itself a Destination to visit." After Visiting this airport, a person's perspective towards Airport building Changes. Airport is planned as a destination were Passenger's plan to stay for a day and enjoy all the facilities given.

Airport have 4 terminals and 1 Jewel which is a indoor garden with refreshments and artificial Waterfalls. All 4 terminal interiors are different and all these 4 terminals connects to Jewel with connecting walking bridge. Jewel is located in centre on all 4 terminals, Jewel is made with a large class Dome with largest artificial Waterfall in the Centre.

#### Sustainability –

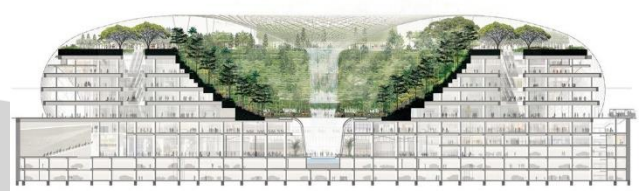
"The landscape approach has proved so successful" said architect, that there are spots within Jewel where you are completely shrouded in greenery. Visitors won't think they are in an actual forest but they forget that they are at the airport.



Figure 14 Indoor Landscape in Jewel

Figure 15 Jewel Plan and Section

1. The huge glass dome currently under construction at Changi Airport will provide 134,000m<sup>2</sup> of retail, entertainment and dining space for both passengers and local residents.
  - The Slide at Terminal 3,
  - Kinetic Rain at Terminal,
  - A Million Times at Changi at Terminal 2,
  - Daisy by Christian Moeller at Terminal,
  - Petalclouds at Terminal 4,
  - Kinetic Rain Drop,
  - Japan Gourmet Hall SORA at Terminals 1 and 2,
  - Many more installations in all terminals entrance and hall area.
 Intermediate places lots of internal Landscaping is planned.



#### Sample – 4 Infinity Airport a Future Airport

A competition held for Concept of Future Airport and this infinity Airport was the winning Entry By Parametric Architecture Design by Daoru Wang Architecture Visualization by Ruguan Liu 2017.

This concept follows Drive Through Airport as Airports are very large and to travel across airports in search of right Boarding Gate and Lounges its difficult for Passengers because many passengers are visiting this airport for the first time, to find the right direction and reach there on time is a difficult Task.

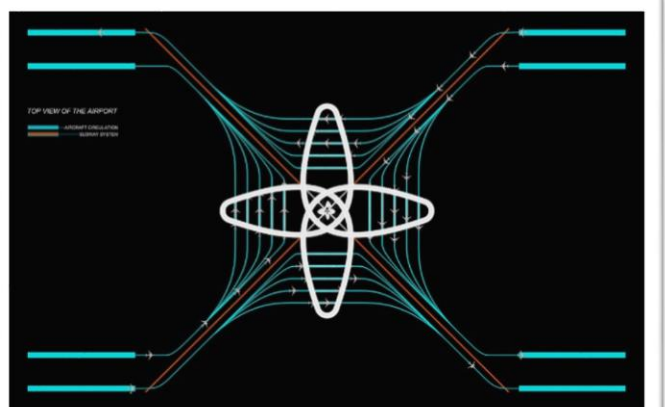


Figure 16 Infinity Airport Render Views

In this type of airport Concept, he tried to place the gates and the drive through area in a loop-

- 1) Which give passengers a close drop off point and reduce walkable area to get to the particular Gates.
- 2) Gate's area or Holdrooms are in loop which gives an excellent circulation and is extremely functional.

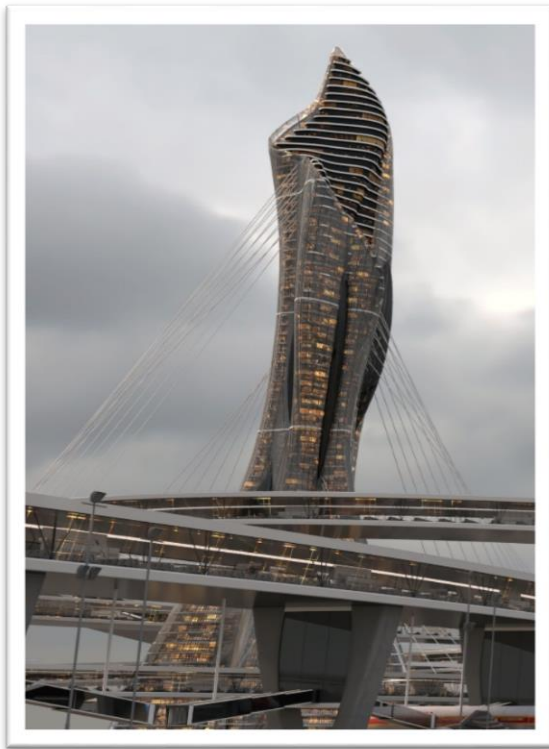


Figure 17 Model showing Loop of boarding Gate

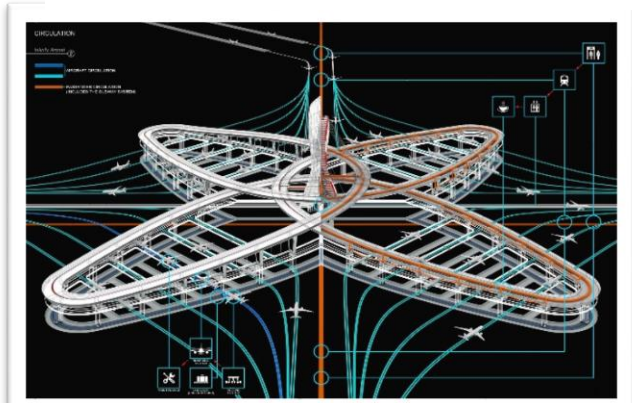


Figure 18 Two boarding gates and vertical terminal building

- 3) Gates for get board in airplane are from both side of airplane, this gives a rapid boarding process and saves a lot time
- 4) Many Functions and spaces of terminal building which takes a lot of horizontal land area is reduce due to the vertical arrangement of terminal spaces and functions that are Entertainment area, indoor Garden, waiting area, Retail Spaces, Checking area, Security, Staff area, Support Office, ETC.
- 5) To improve Efficiency of the airport, this project underwent intensive research of different aspects of airport functions like – Aircraft traffic flow, Passenger Traffic flow, etc.
- 6) This looping circulation concept was inspired by torus knot which appears like two overlapping INFINITY

- 7) The general shape of the airport combines the complexity of the form and the ideology of INFINITY by creating the circular and endless concourse system.

### Key Learnings -

How Passengers can expect the future of Airports by advancing the planning, function and technology.

### Why Airports should be Designed to Influence human Behaviour??

- 1) Airports are Complicated.

Area unit infinity moving components in and around them, from passengers to baggage, and from staff of airport to the planes themselves. And airports serve multiple uses, they're industrial buildings with a cordial reception element and a civic responsibility.

One of the foremost necessary tasks of an airport is to get passengers from the front curb to their boarding gate without much human guidance. To accomplish that, they bank heavily on refined style cues and human psychology.

- 2) Managing Stress and Anxiety.

#### a) Space -

For many travellers, walking through a terminal can be one amongst the additional anxiety-inducing components of their journey, so airport Terminal building designers do their best to make a relaxed and calm surrounding environment. Once it involves the foremost trying half to the most stressful part — security — they're restricted in what they will do.

“When designer design a column free space and provides enough vertical volume so it doesn't feel like you're being pressed through a strainer.”

#### b) Relaxing elements -

The result will minimise the stressful walkthrough experience. The relaxing and clam part of the airport walkthrough is experience in airside, lounges, Holdrooms. In order to create a calming atmosphere for passengers, designers rely on additional techniques. Designers hunt for new opportunities to incorporate natural lightweight, art and landscape component,” to reduce stress of passengers.

#### c) Sound -

Sound, too, has an impact on wellbeing. “I think lowering the acoustics and decluttering sound stimuli is really important for de-stressing people,” said Moore.

Mumbai's Chhatrapati Shivaji International Airport in India designed by SOM at the infinity drone of announcements of fights is purposefully absent. Regarding any emergency they have announcement. Yet not any repeating announcements so. Airport management don't allow bars and restaurants play music in the public space. Airport management looks after the



music and they play wonderful Indian sitar which is pleasant and stress releasing music in background at very low volume.

**d) Enjoyable facilities -**

A overwhelmed passenger is going to spend more in airport facility, than passenger who is miserable, stressed and anxious. Airport visitors and passengers really consider as customers because they're the financial lifeblood of airports."

Travellers spends on airport is one of two main sources of revenue for airports and the other is airlines renting out office, boarding gates, lounges, etc so it's absolutely in the best interest of airports to keep travellers happy and willing to spend.

**e) Managing Expectations -**

It's not all about the airports controlling your behaviour — they do need to keep up with passenger demands as well. All the new recreational offerings at airports have to do with the sophistication of the travellers. Best example for managing expectation of passenger is airports at Singapore's Changi, which is a veritable playground for adults and kids alike.

**Key learning –**

1. Space for Meditate before boarding flight, makes sure to mentally prepare and visualize for the experience passenger is about to encounter, strengthening their ability to deal with the stress.
2. Airport design Should lighten the mood
3. Airport interior herd passengers with art, and distract them from the stress of traveling.
4. Retail Shops should be at strategically placed and give more options to passengers to overwhelm them.
5. Local food, craft, culture gives a good experience to passengers, local one feels they are home, and tourist enjoy the differentness of place and culture.
6. Falling water sound calm's the person in stress, designing Water body in intermediate areas can help passengers to destress.
7. Biophilic architecture can be one of the best options in interiors which consist of indoor landscaping. According to researchers biophilic design which involves natural elements and natural elements destress the humans. It's said that as humans come in contact with other natural elements like water, plants, Stone, etc. it treats human as destressing element.
8. Indoor Landscaping not only in public area but also in office area where airport staff have good health and productivity.
9. Designing elements in hall for check-in, can create a liveliness to atmosphere.
10. Indoor garden, playground, Theatres, Art gallery, Museum, Suites, capsule hotels, parks, swimming pool, Gym, different Restaurant, Shopping retails, Dinning space which can be used by passengers in time between check-in and boarding the flight.

11. Wall art, paintings, murals on the wall of long corridor and pier.
12. Airport design should Keep passenger busy in excitement to explore airport and it's facilities.
13. Natural Light in interiors of waiting space, and corridor also reduces stress.
14. A single queue in check-in, security and immigration can great a stressful area, try to have multiple queues for the same.
15. Colours used in interiors matters a lot on the phycology of passengers.

## II. CONCLUSION

1) According to local Culture and material availability one can design Unique Airport Structure and internal aura. Tackling Passengers expectations not its more then a necessity and luxury. Giving them a Airport vibes of local culture, nature, history, Specialities, etc.

2) Theo Structure is very important part of airport; it can also be used as an opportunity to use the local construction material and technics in a modern and Unique Manner. For example, Mactan Cebu International airport- Used a local material and construction Technic in a modern and Unique way. In this local population also inspire to follow local culture, technics and Material. Tourist will overview the culture and local architecture from the airport itself.

3) India is rich with ancient architecture, Culture, History, local handicrafts, Food, Rituals, etc. Every state has its Uniqueness in culture, language, Architecture, Construction material. Each Indian State and city Culture can be show in the Local Airports, according to 5 different Climate can give an opportunity to many Strategies for planning a Unique Airport. Which can be merged in the local Buildings and at the same time it can be a landmark of the city.

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