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Project 2

Designing new experience of next-gen tourist houseboat for Kerala backwaters

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Context
Research
Design Brief
Package
Concepts
Design



Context

Research

Design Brief

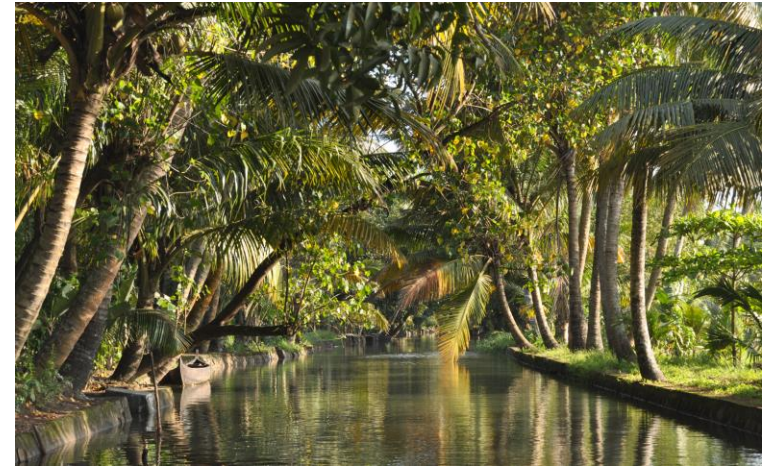
Package

Concepts

Design

Kerala & its backwaters

- Located in south-west India
- Tropical monsoon climate
- Western ghats - prominent geographical feature
- 44 rivers
- Roughly 900km of backwaters



Kerala & its backwaters

- Backwaters very unique in Kerala
- Rich flora and fauna
- Major tourism product of Kerala
- Traditionally for transport of goods



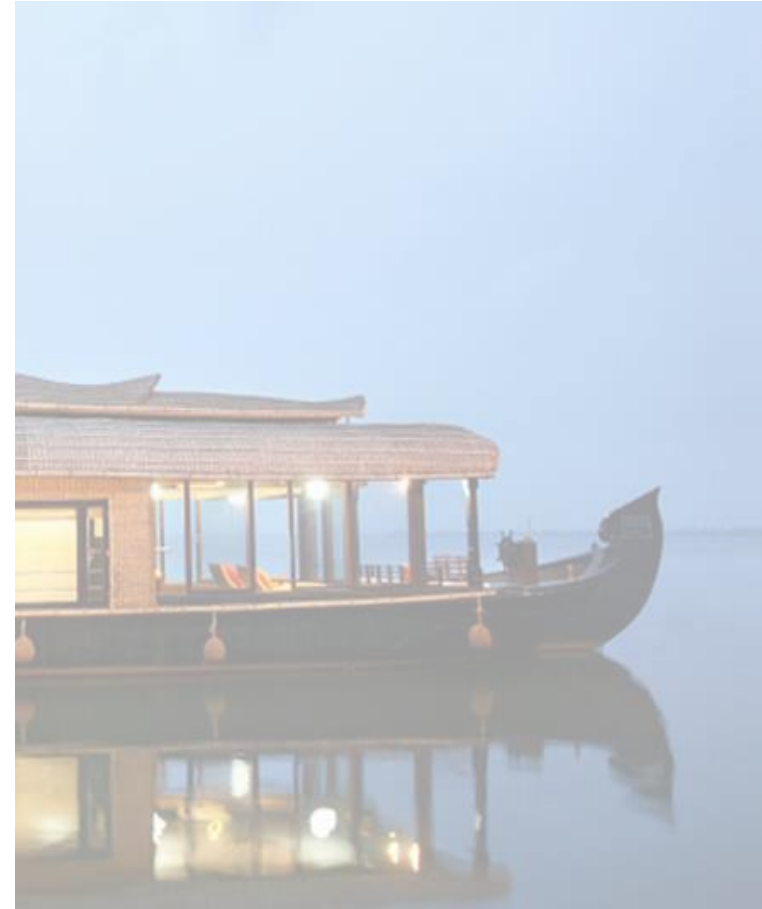
Backwater tourism and Houseboats - then

- Roughly **900km of backwaters** in entire state
- Evidence of **backwaters being used for transport of goods and people dates back to 3000 BC**
- Mainly used for spice trade purposes, transport of food items, and other cargo
- Main mode of transport was by means of “**Kettuvallam**” - **doesn't use nails or rivets - first known type of houseboats in Kerala**
- As road networks became fit for travel, backwaters were used only to transport heavy cargo which could not be managed via road



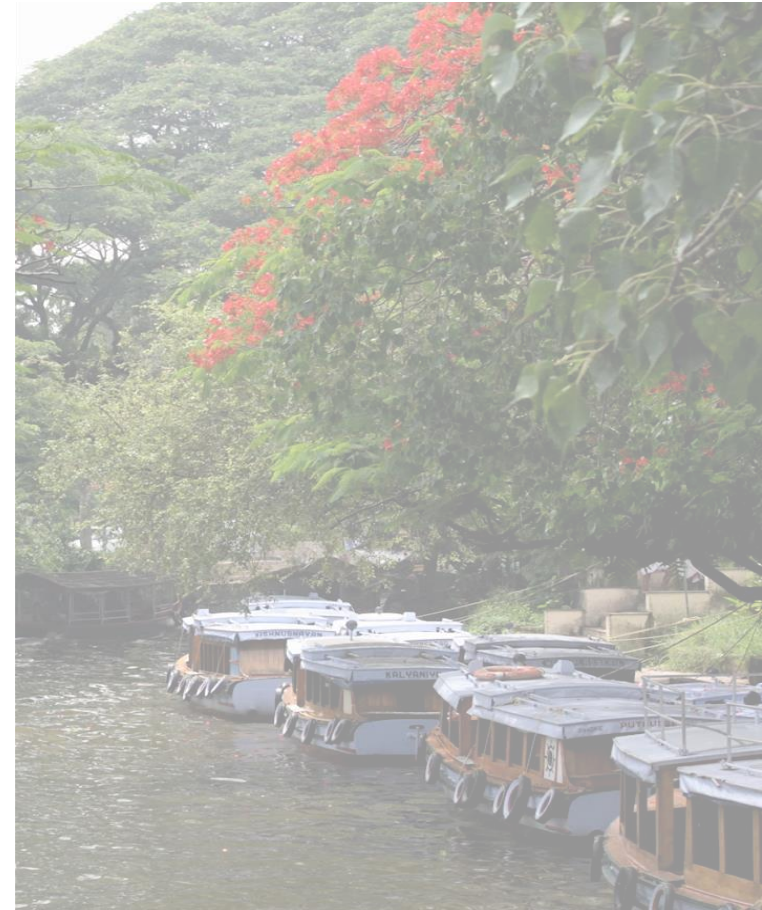
Backwater tourism and Houseboats - now

- Houseboat industry propagated by Kerala government as a tourism venture - now contributes to roughly 10% of state's GDP
- **Newer houseboats use FRP hulls instead of wood, and use diesel engines** (earlier a long, pole of wood or bamboo was used to push the boats and navigate them through waterways)
- **Numerous changes in the structure of boats, construction methods, materials, etc**



Backwater tourism and Houseboats - statistics

- Alleppey attracted around **75000 foreign** and **4.3lakh domestic** tourists in 2017, and this number is rising annually
(Kerala Tourism Statistics - 2017, keralatourism.org)
- Focused mainly on backwater experience
- Leisurely vacation - not focussed on adventure tourism
- By 2015 - **740 registered houseboats** and around **500 unregistered ones**



Backwater tourism and Houseboats - impact

- Heavy **water pollution** due to **oil leaks**, **improper disposal of food** and **plastic waste**, **toilets draining waste into backwaters**
- **Engines cause noise and vibration** - causes **harm to flora and fauna** - also creates **noise pollution** : tourists and local residents are disturbed
- **Need for a safer, cleaner and comfortable option**
- Present experience very limited - **user experience can be enhanced** and this can further increase tourism potential



Houseboat scenario around the globe

- Rising land price and unavailability of land - many choosing to live in houseboats - phenomenon occurring across Europe mainly
- **Majority of houseboats are moored and are not used for travel or leisure purpose, but as permanent homes**
- The tourist boats are mainly floating hotels which look like buildings mounted on hulls or barges
- Moving leisure houseboats exist in Zimbabwe, USA, Canada and Australia - used for recreational activities
- Tourism activities related to lakes and national parks - fishing, sightseeing, etc
- **No particular design language followed - mostly look like contemporary houses mounted atop floats with few exceptions**





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- Form, Experience, Technology

Form study - history

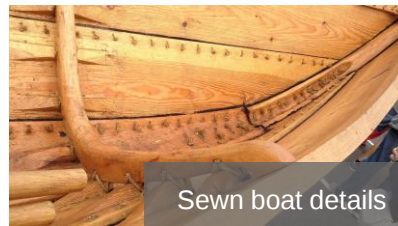
- The present Kerala houseboat designs can be traced back to sewn boats **developed in 3000 BC** - Known as '**kevuallam**'
- A type of kettuvallam
- **Similar to the earliest types of sewn boats found in Egypt** dating back to 3000 BC - evolved from papyrus boats
- **Influence maybe due to trade relations** which existed between both regions
- Used for transporting goods, people, and for fishing



Ancient papyrus boat - recreation



Ancient Khufu boat



Sewn boat details



Kerala kettuvallam



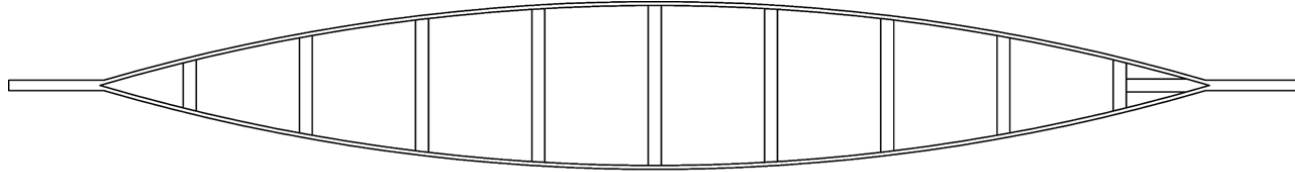
Kerala kettuvallam

Form study - evolution

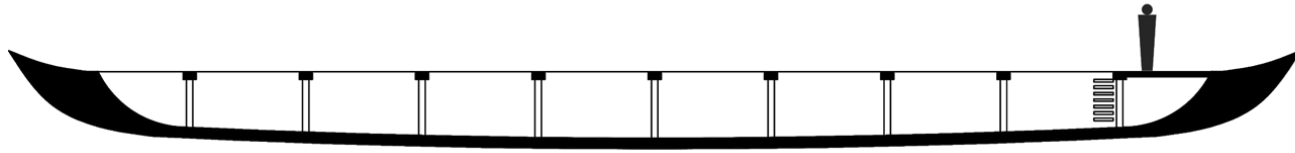
- Kevuvallam - first type of kettuvallam - in use today
- **Wooden members** tied together using **coir ropes**, gaps filled using coir and then coated with a **resin made from boiled cashew kernels**
- **100 ft long, 13 ft wide** in the middle
- **Used to carry load** upto 30 tons - initially not used for transporting people



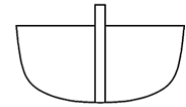
Form study - evolution



Layout made up by two slow curves enclosing an area in between



Area inside hull used as functional space for storing cargo



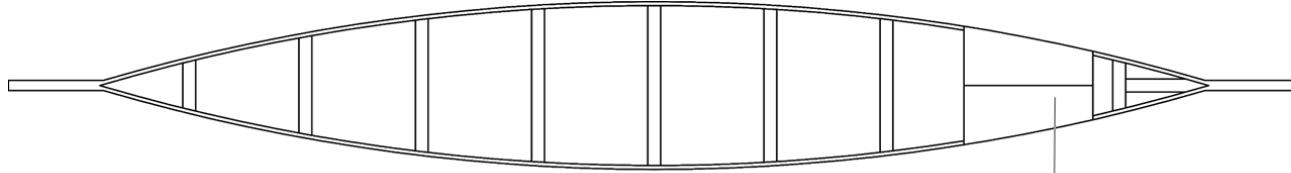
Flatter bottom

Earlier version had symmetrical 'kombu' or horns - inspired from elephants

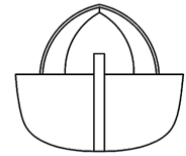
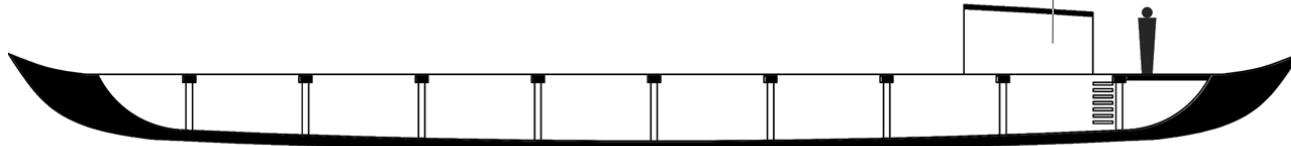


Type 1 - 3000 BC

Form study - evolution



Similar layout as initial design, roof structure added for shade for the driver



These designs were mainly for longer journeys and came to be known as spice boats

Front horn - 'Aniyam'



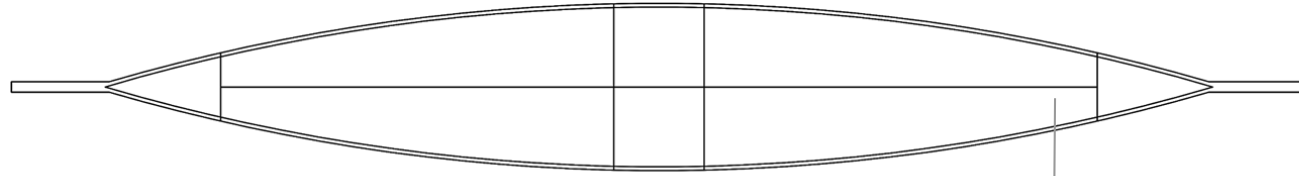
Type 2 - 3000 BC

Form study - evolution

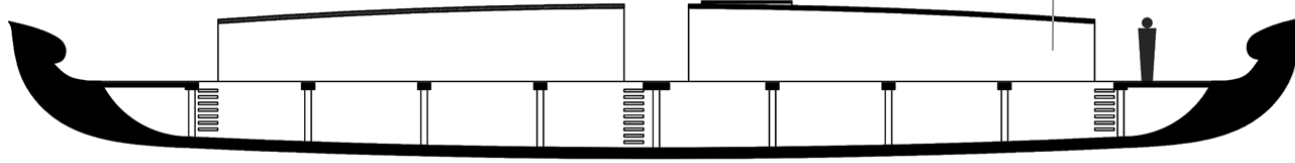
- Started taking shape into a house boat by late 1800
- Cargo transport happened via road - backwaters used for transport of people
- **Became homes for people in backwater areas**
- **Hull became living quarters**
- **Roof system made with bamboo** shoots as structural support, **bamboo mat**, **coir ropes**, etc



Form study - evolution

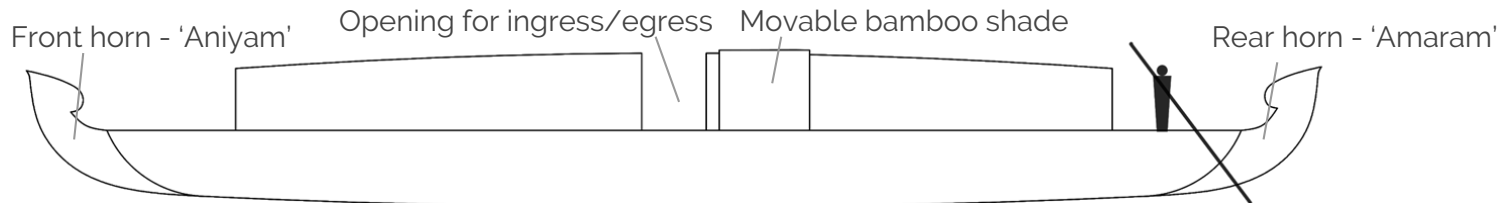
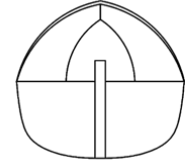


Larger roof structure to cover entire boat - completely residential or for transporting people



Entire hull space turned into living quarters - roofing by bamboo and cane

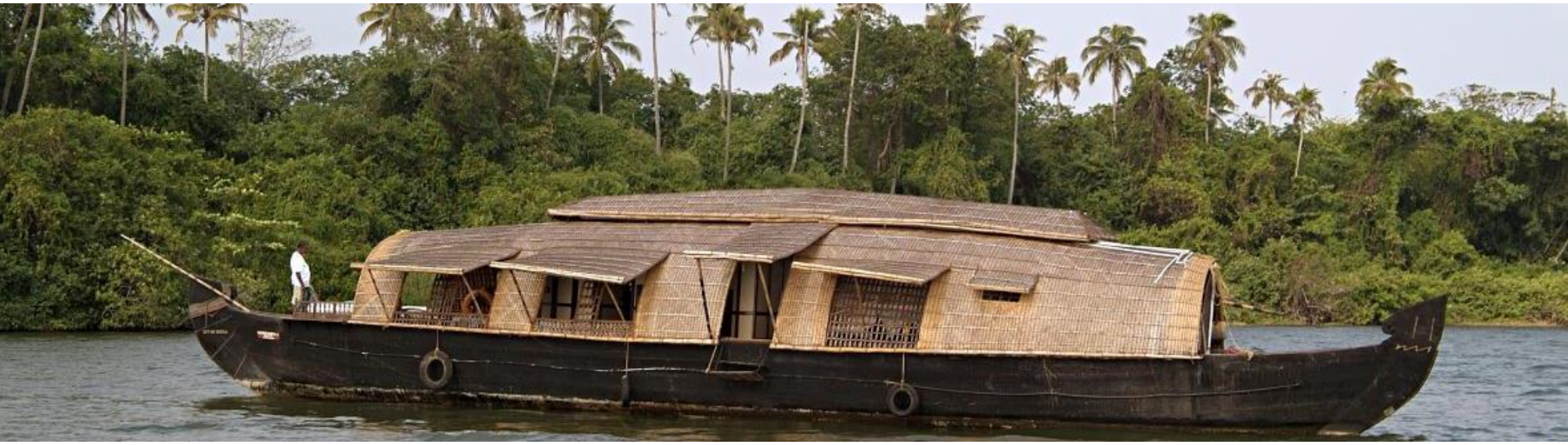
Arched roofing - achieved by bending bamboo and making structural member



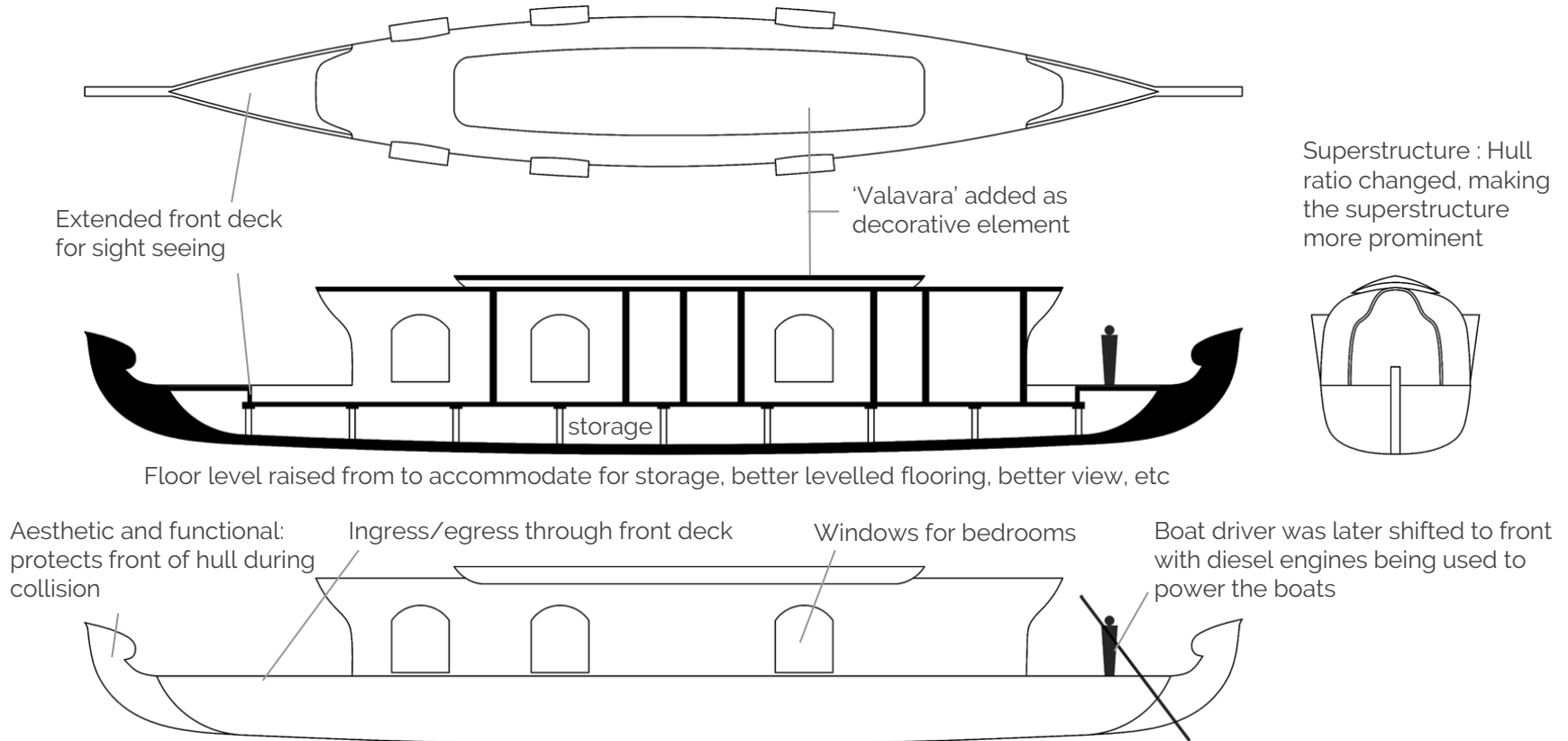
Type 3 - 1800 AD

Form study - evolution

- Babu Varghese - First tour operator in Kerala **introduced houseboats as tourist cruises in 1992**
- Redesigned **interiors in a hotel style**
- **Wood used extensively** in interiors
- Initially was driven by long poles - later became outboard engine boats, and then inboard engines



Form study - evolution



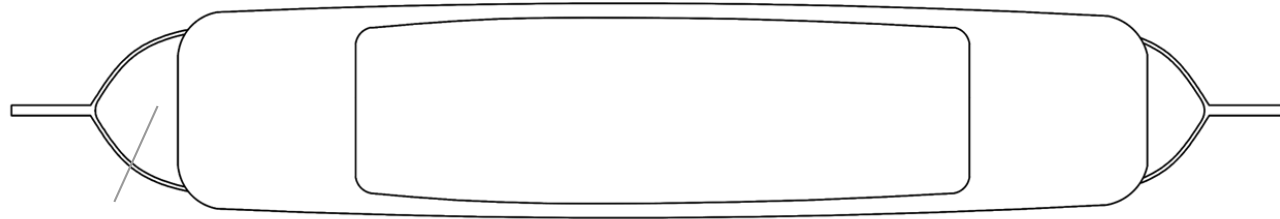
Type 4 - 1992 AD

Form study - evolution

- By 2004 a new array of houseboats were launched - featuring **iron hulls - later became FRP hulls**
- Air-conditioned
- **Hull had bulkheads**, sewage treatment unit, storage space, water tank, etc
- **Grew wider** and started featuring more bedrooms - became truly luxurious



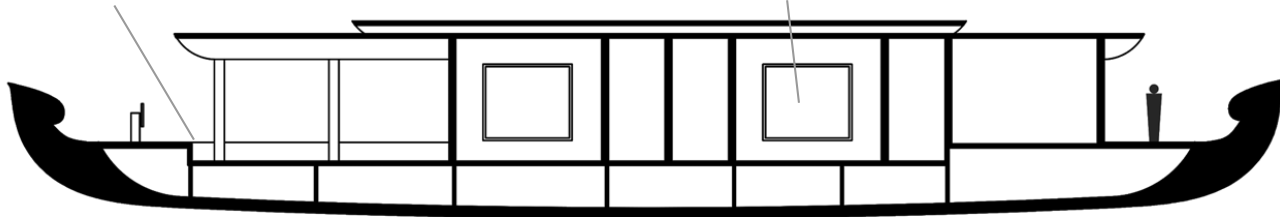
Form study - evolution



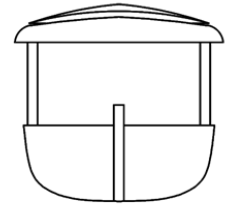
Extended front deck
for sight seeing

Rooms became air conditioned

Wider hull - creates
more space

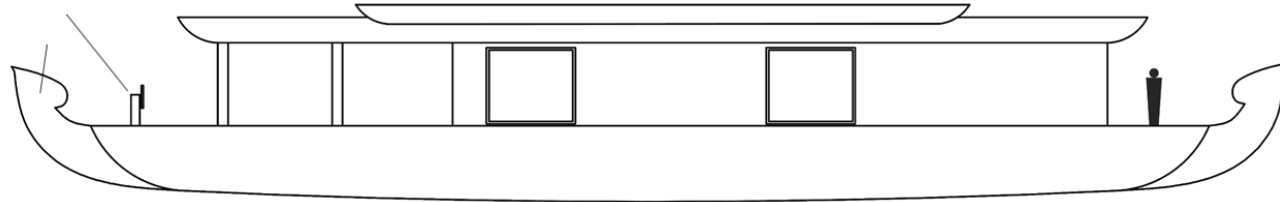


Hull space divided into bulkheads, water tanks, biodigester, fuel store and engine room



Driver shifted to front

Roof present as a separate entity unlike earlier



Type 5 - 2004 AD

Form study - evolution

- Further, the **form developed and started including upper deck levels** and additional floors.
- Formwise, they only change which happened with addition of a deck was the roof was either lifted or expanded



Form study - evolution

Materials

Woven bamboo / palm
leaf mats for roofing

Bamboo for roof support
structure



Wooden hull

Woven bamboo / palm
leaf mats for roofing with
leakproof layer(PVC or
tarpaulin sheet)
sandwiched

Wood/steel for roof
support structure

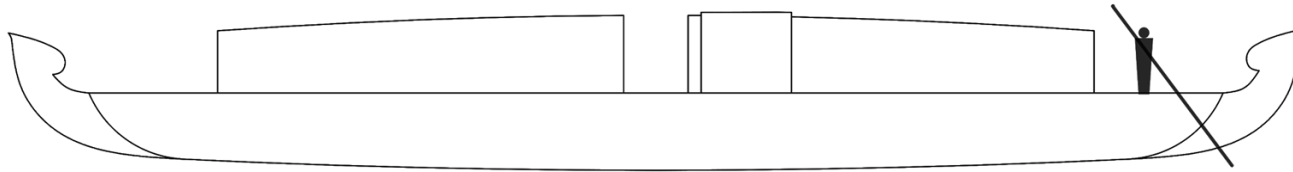


Walls with wooden/steel
frames, marine ply boards
and bamboo mat cladding

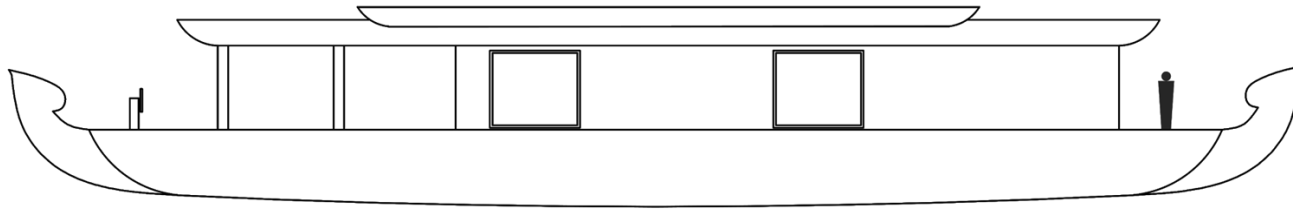
Iron / FRP hull

Form study - evolution

Proportions - Changed over time



Earlier 1:1
approximately



Presently 1:1.5 or
1:2 for double
deck boats

Form study - evolution

Metaphor - Elephant

- Masculine - 'komban' - tusker - aggressive, sharp, pointy



- Feminine - 'churulan' - tame, rounded, smooth



Form study - influencing factors

- Traditional architecture

→ Heavy use of wood, earlier homes had roof with thatch/woven mats



- Climate

→ Roof developed as barrier primarily against rain. Sloping character to channel rainwater off

- Materials

→ Highly organic shapes cannot be achieved as woven mats used - bamboo structure gave arch shape

- Function

→ No roof structure when used as cargo - roof structure developed when it became residential - developed decks and boxier cabins when used for tourism purpose

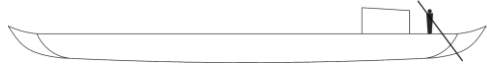
→ **Proportions can be drawn from traditional houses - present architecture much modern**

→ **Extended shade required to prevent sun and rain**

→ **Modern materials can be used - local material use skill dependant + high maintenance**

→ **Newer function based form can be developed**

Form study -



FUNCTION

→ Carrying cargo

→ Carrying cargo - spices

→ Residential units

→ Tourism - leisure boat

→ Tourism - leisure boat

MATERIALS

→ Wood

→ Wood + Bamboo

→ Wood + Bamboo

→ Wood + Bamboo

→ Iron / FRP + Wood +
Bamboo

TECHNOLOGY

→ Craft + Human powered

→ Craft + Human powered

→ Craft + Human powered

→ Craft + Human powered +
Electrical systems (lights, fan)

→ Craft + Industrial manufacture +
Diesel engine + Electrical systems
(lights, air conditioning)

Participatory design approach - Why?

- Project deals with generating new tourism experience along with form
 - Assuming experiences will give a very narrow perspective of the design problem, therefore **potential users have to be identified and probed for possible new insights**
 - Since it involves experience generation, **explicit and observable information is inadequate** - necessary to **understand tacit information and uncover latent needs**
 - Participatory design - **user will develop his own sub-story** based on a narrative provided, fill in details **based on his aspirations**
 - **Narrative through verbal info, showcards**
-
- Will help understand what users expect from a backwater tourism scenario, how they perceive it presently, what they find lacking, and what more they want from it?
 - Generate experiences based on user aspirations



Part A - Basic Info

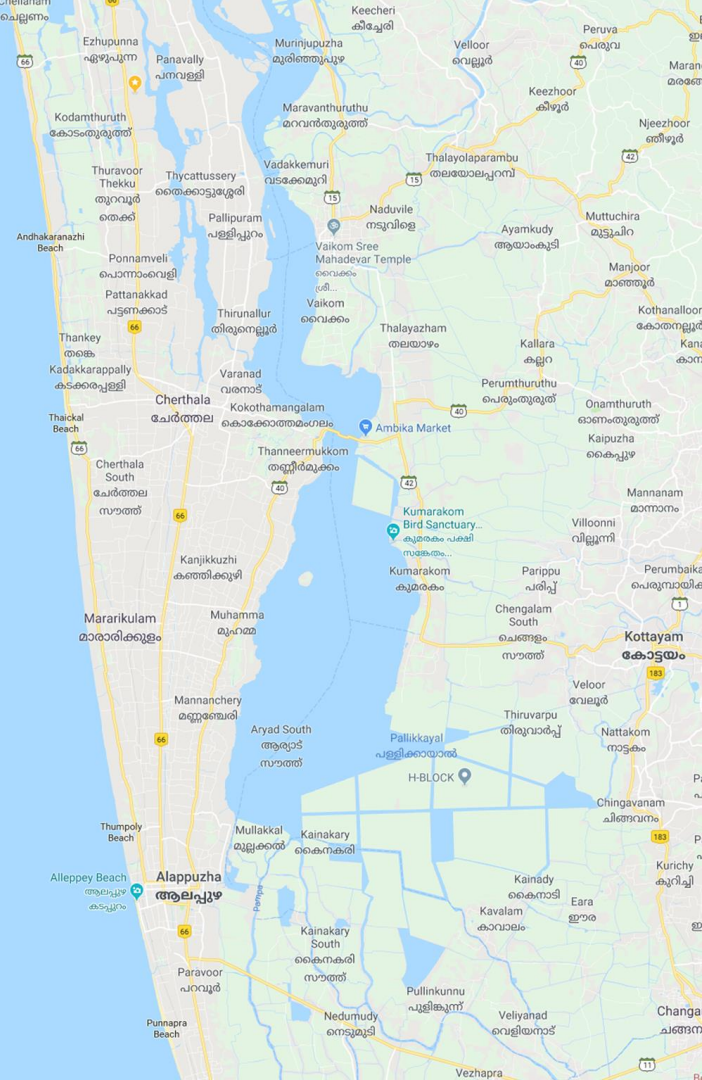
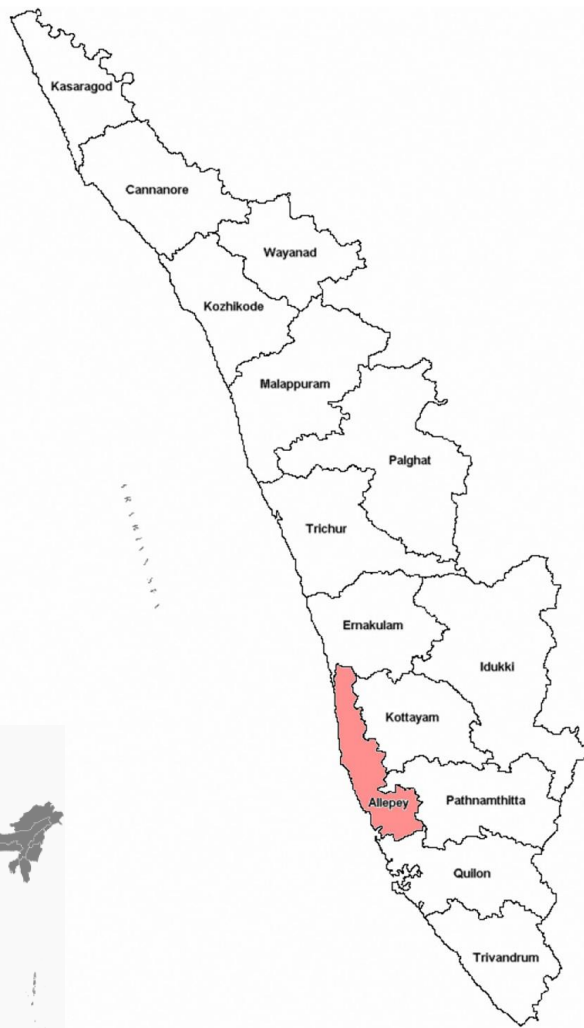
- Name
- Age
- Location
- Profession
- Income

- To develop initial connection with user
- Understand demography - from where would he/she travel, how much time can be spent on vacation, how much can they afford?



Part B - Priming

- Explain about location
 - Brief history on backwaters and tourism
 - Visuals as aid
-
- Educating user about scenario
 - Visuals will help user relate to place more











Part C - Task 1

- "If you would choose to have a vacation here, who would you spend it with?"
 - Family
 - Friends
 - Romantic trip
 - Solo
 - Business retreat
-
- Creates a basic setting for the narrative
 - User will inadvertently relate further experiences on the basis of this choice

Part C - Task 1

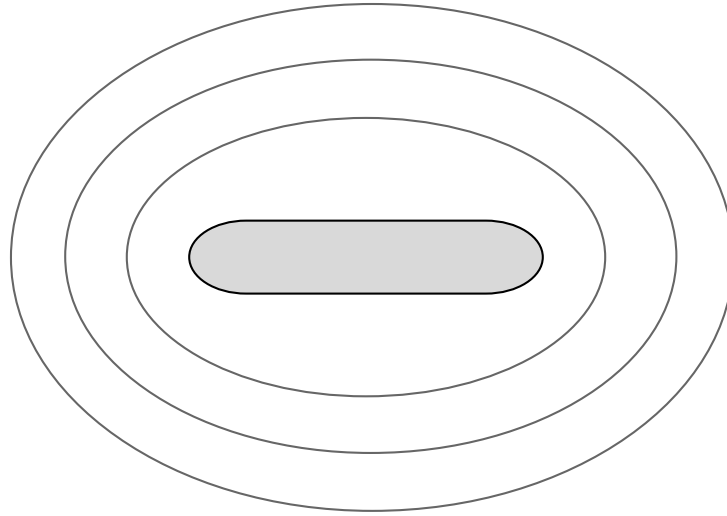
- "Pick a spot"



- Each spot different based on privacy, views, proximity to land. etc
- Gives us an idea of whether user wants a pure water based experience or a mixed experience

Part C - Task 2

- Diagram



- Chart with boat diagram given - each circle represents level of proximity to the boat
- This forms the base board on which user does further activity

Part C - Task 2

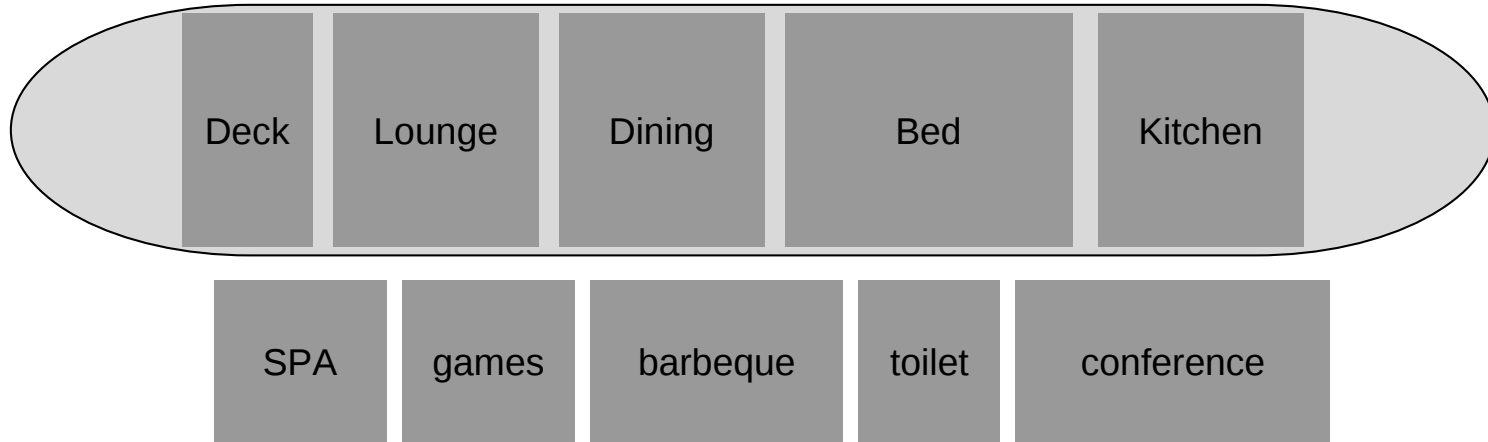
- “Place them”



- Images based on different views and experiences in the backwaters
- Users can place them on the diagram based on the proximity at which they want these elements

Part C - Task 3

- “Pick spaces which you would want on your boat and place them”



- Brief info on spaces will be given - Users asked to pick and place the spaces as per they wish
- Placement maybe be based on the experience they wish to have - privacy, views, party, etc

Part C - Task 4

- "Select words which you would relate to while having such a vacation"
 - Adventure
 - Relaxation
 - Explore
 - Guide
 - Recreation
 - Scenery
 - Sharing
 - Culture
 - Entertainment
 - Food
- This task will give an assessment of how users want to spend their holiday in backwaters - the activities which they'd like to partake in, the experience which they'd like to enjoy
- The images picked out for each word will give a rough priority of the user as he will unknowingly associate more images to the word he feels attached to

Part C - Task 4



Part C - Task 4



Part C - Task 4





Results & Insights

Results & Insights

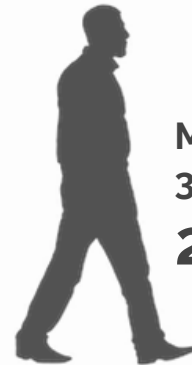
Total **16**
users



Male
18-25 yrs
2



Male
26-30 yrs
5



Male
31-40 yrs
2



Female
18-25 yrs
3



Female
26-30 yrs
2



Female
31-40 yrs
2

Results & Insights - Task 1

- "If you would choose to have a vacation here, who would you spend it with?"
 - Family
 - Friends
 - Romantic trip
 - Solo
 - Business retreat

Results & Insights - Task 1

Romantic trip **6**



Family trip **4**



Solo trip **4**



Friends **2**



Business retreat **0**



"This is one of those spots I would love to spend time at with my wife. Long time since we just relaxed, just the two of us"

"I've always wanted to go to such a place with my family. My son loves nature. Also, this is one of those places which I can feel that sort of authentic connection with nature "



Results & Insights - Task 1

- "Pick a spot where you'd like to spend maximum time at"



- “Pick a spot where you'd like to spend maximum time at”



Results & Insights - Task 1

Maximum spots taken up nearer to land.
Users want a feeling of solitude, but at the same time feel safer if closer to land



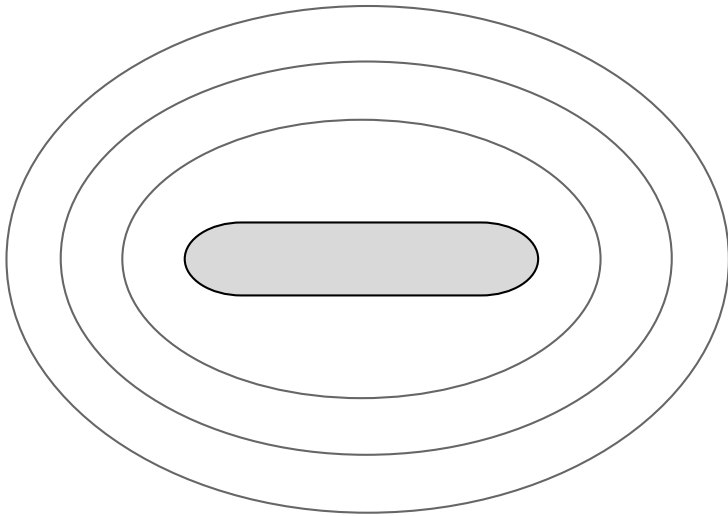
"The location looks interesting. I want to spend my time closer to the mainland, but enough far off so that I can enjoy the houseboat ride"

"I want it to be closer to mainland, but it should afford view of waterways on three sides and paddy fields on one side "



Results & Insights - Task 2

- “Pick and place the views you want to see from you boat”



Results & Insights - Task 2

Level 1



Level 2



Level 3



"I would prefer to see water all around me. It gives that soothing and relaxing feeling. Land can be a bit away, but water is what I want to see and feel when I'm there"

"Having nature all around is what I would prefer. It'd be wonderful if I can see such sunrises and sunsets every single day"



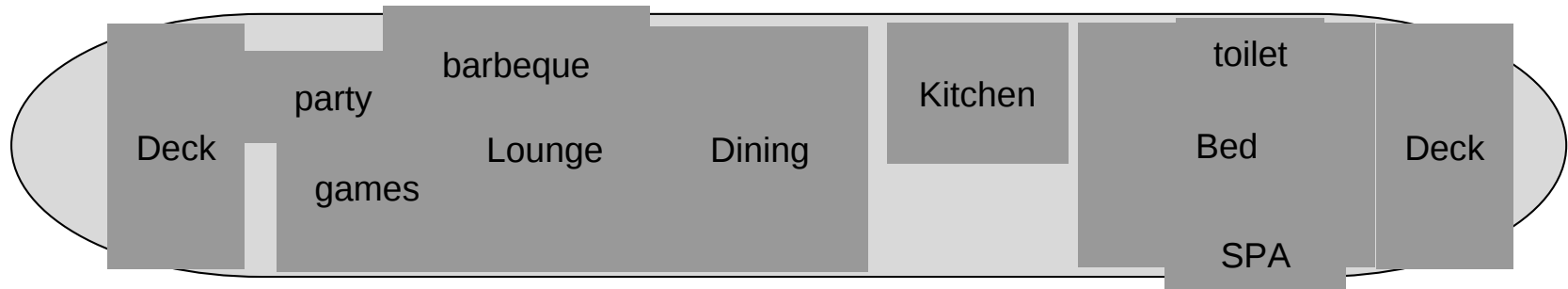
Results & Insights - Task 3

- “Pick spaces which you would want on your boat and place them”



Results & Insights - Task 3

- “Pick spaces which you would want on your boat and place them”



“I don't want any walls between spaces. Everything should just flow together from one to the next”

“Bedroom should have really good privacy. But at the same time I should be able to see all those views from my bed itself.”



Results & Insights - Task 4

- "Select words which you would relate to while having such a vacation"

1 Scenery

2 Relaxation

3 Food

4 Explore

5 Recreation

6 Adventure

7 Culture

8 Entertainment

9 Guide

10 Sharing

People more interested in being relaxed
and enjoying the sites than to proactively
do adventurous activities

- Scenery



"From what I've heard about the place, I don't think I'll be able to finish seeing the entire place in one go"



Results & Insights - Task 4

- Relaxation



"I just want to forget about the rest of the world for sometime. If this place offers me such an experience, I'll be more than happy to do this every year"

"Is there anything other than relaxation which is to be done in such a place?"



Design Brief

- Design a next generation single bedroom houseboat for a family vacation in Kerala backwaters
- The design should satisfy the following:
 - **Main user group is couple tourists.** The spaces should satisfy the area requirements and meet standards of luxury houseboats - Bedroom (minimum 150sqft), lounge, viewing decks, dining space, kitchen, toilets (minimum 45sqft).
 - The spaces designed should **enhance the overall experience** of the vacation - maximize views, relax & unwind
 - The form design should **complement traditional Kerala houseboat designs** and at the same time **reflect modernity**
 - Should also include service & storage spaces - **Quarters for housing 2 staff members** (driver, assistant/cook), **water tank, sewage tank, grey water recyclers**
 - The boat **will be based on an existing hull designed by Samudra Shipyard Pvt. Ltd.**
 - 30m long, 5m wide



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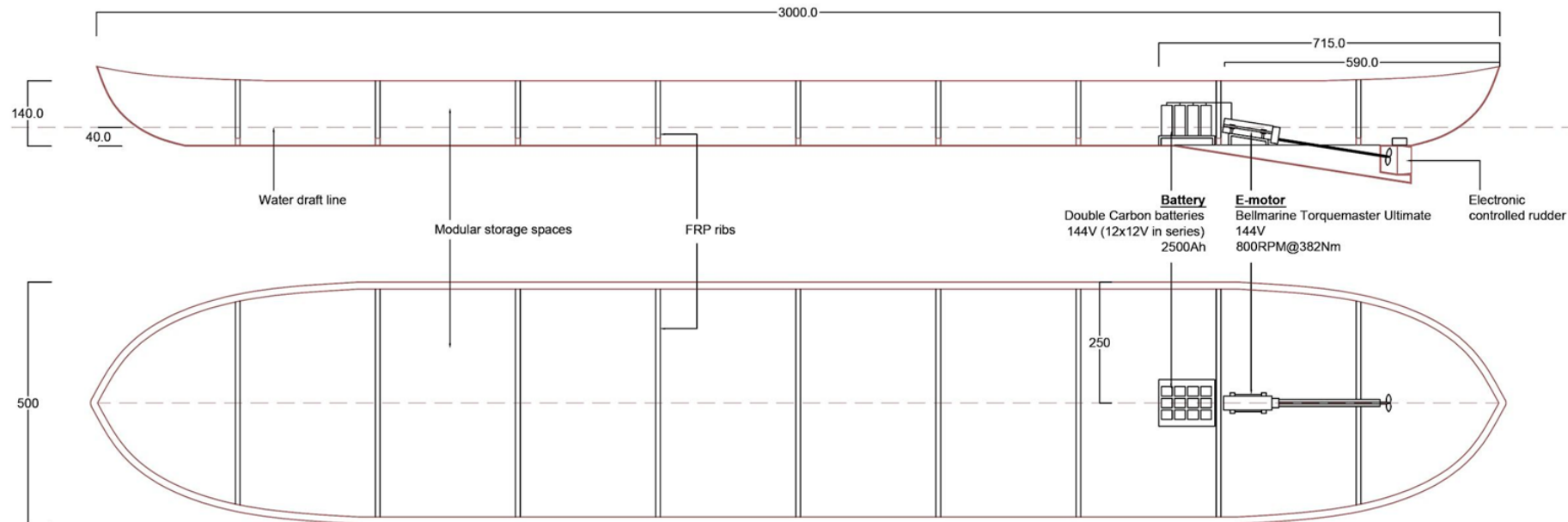


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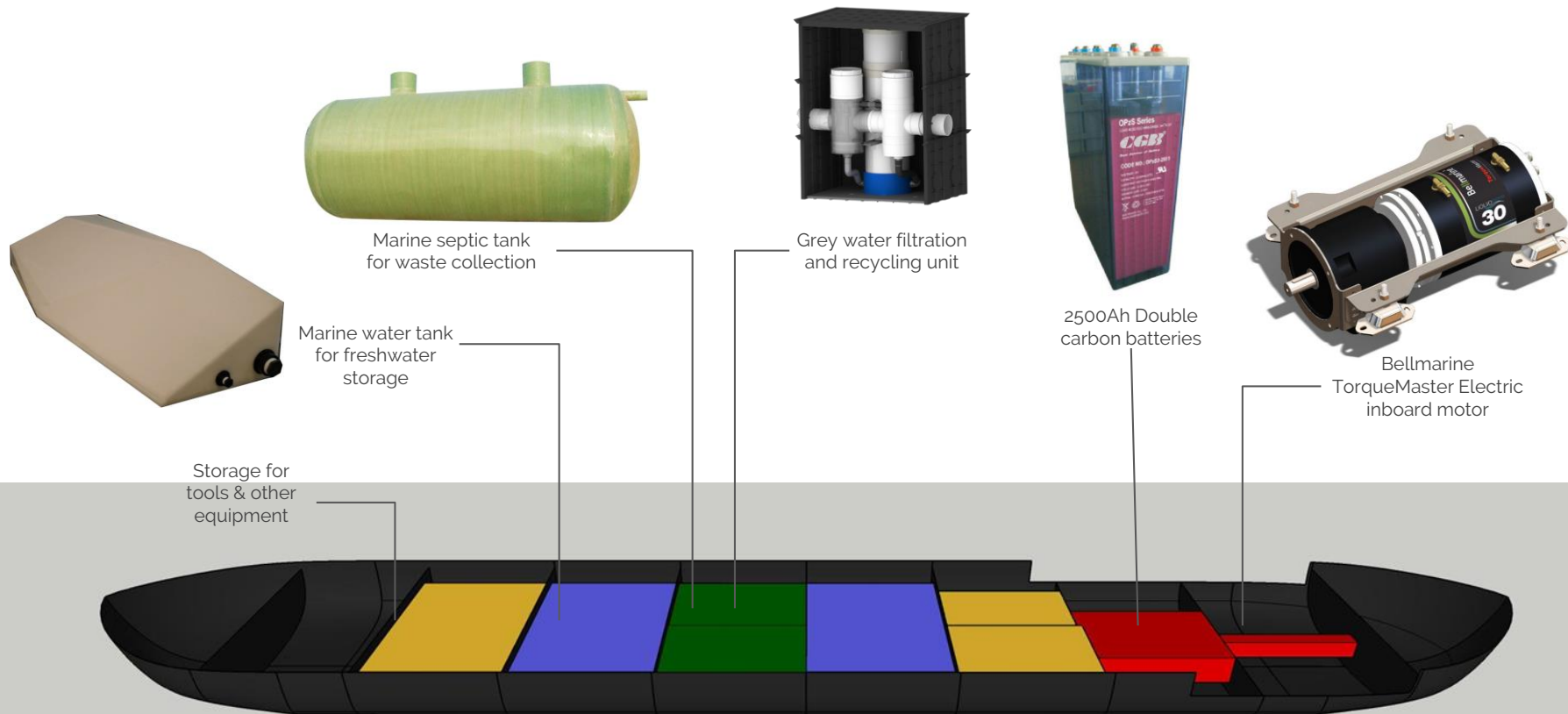


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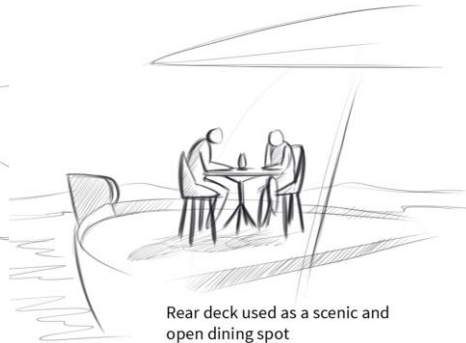
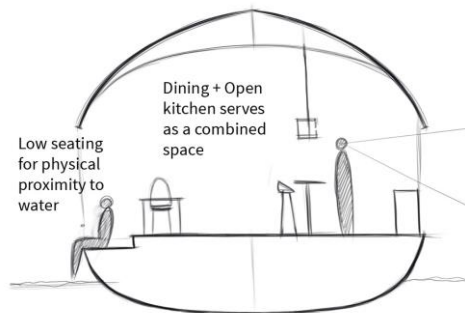
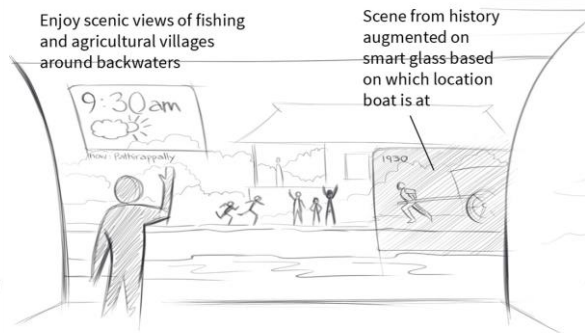
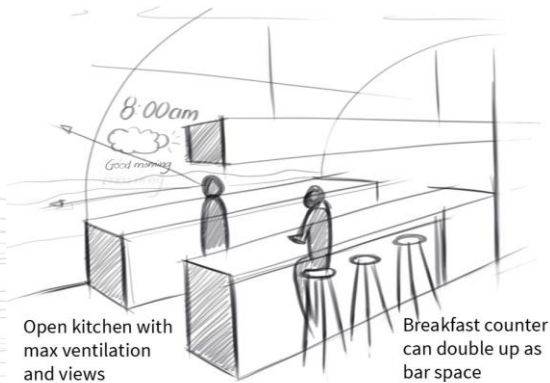
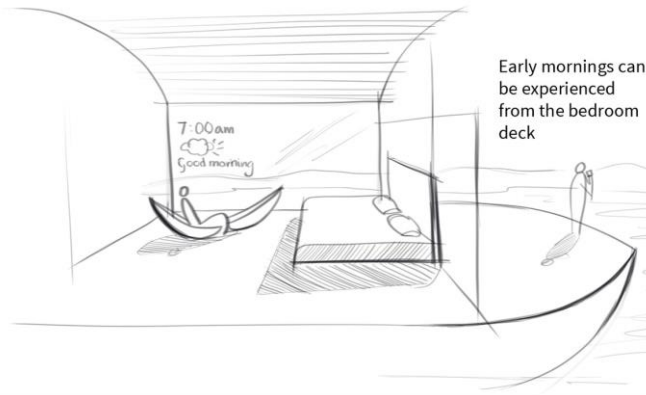
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- Experience, Form

Experience

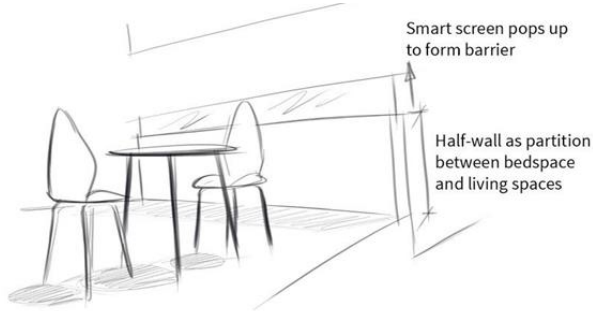


Experience

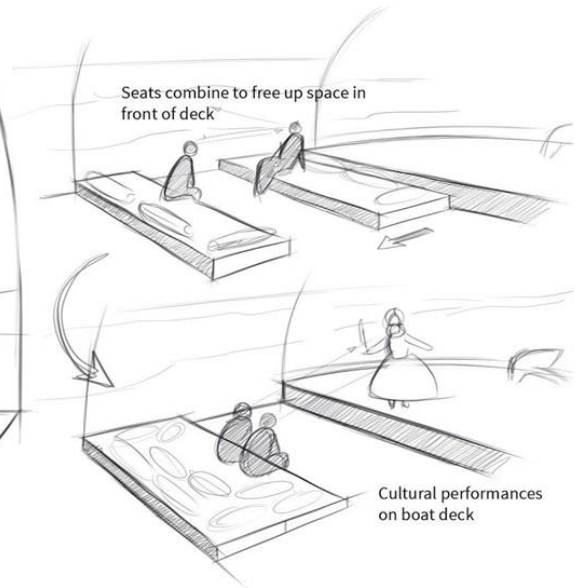
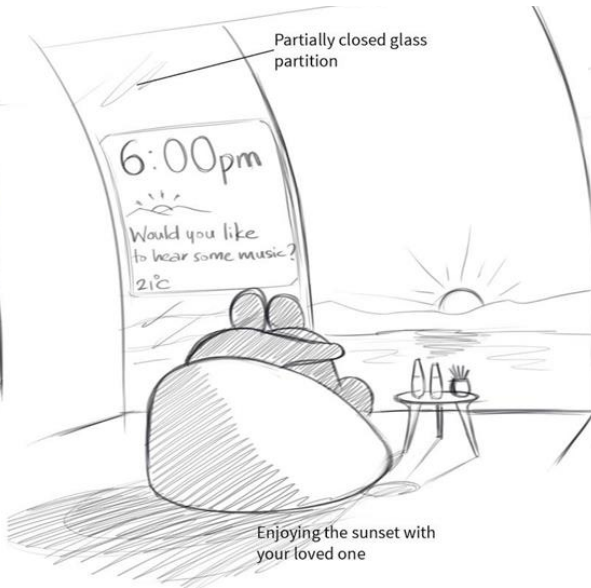
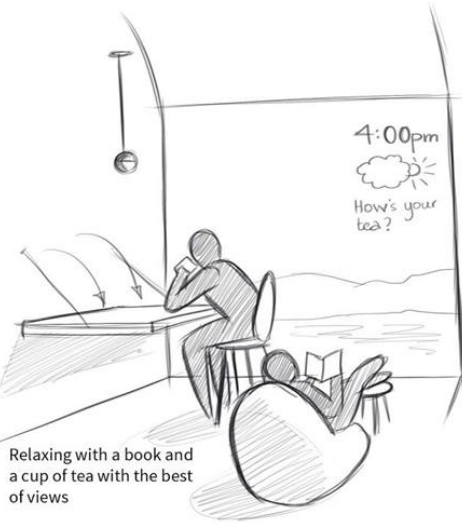
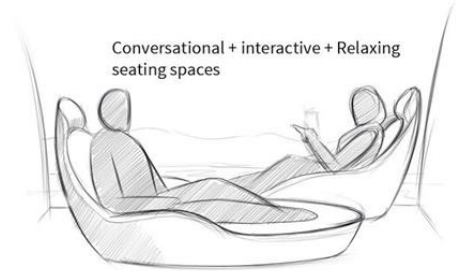
Decks as a photopoint



Smart screen pops up to form barrier

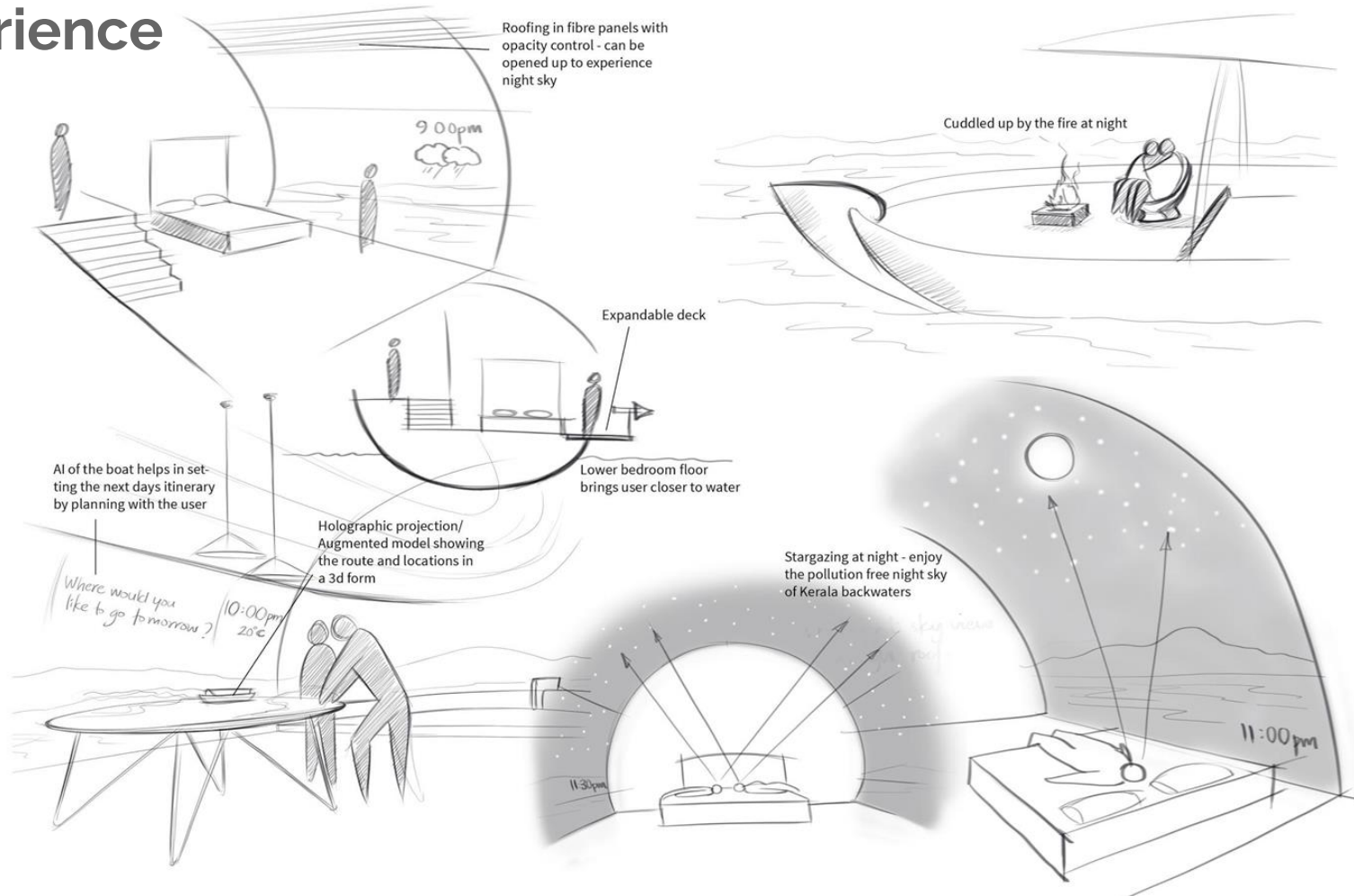


Half-wall as partition between bedspace and living spaces

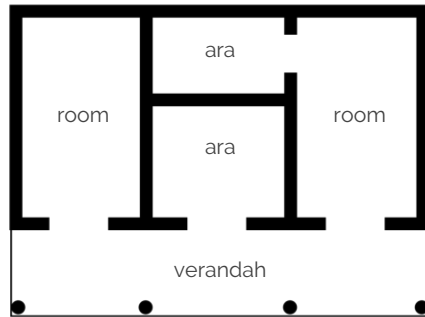
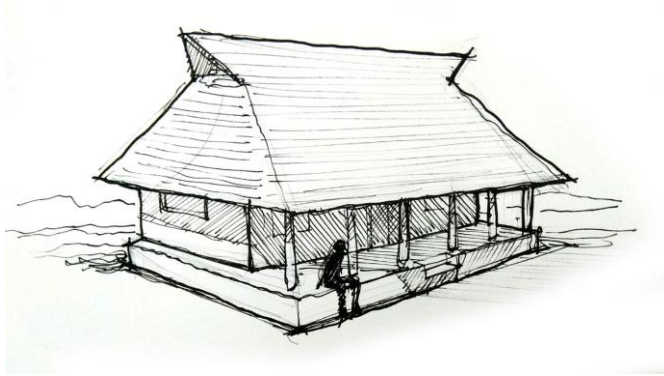


Seats combine to free up space in front of deck

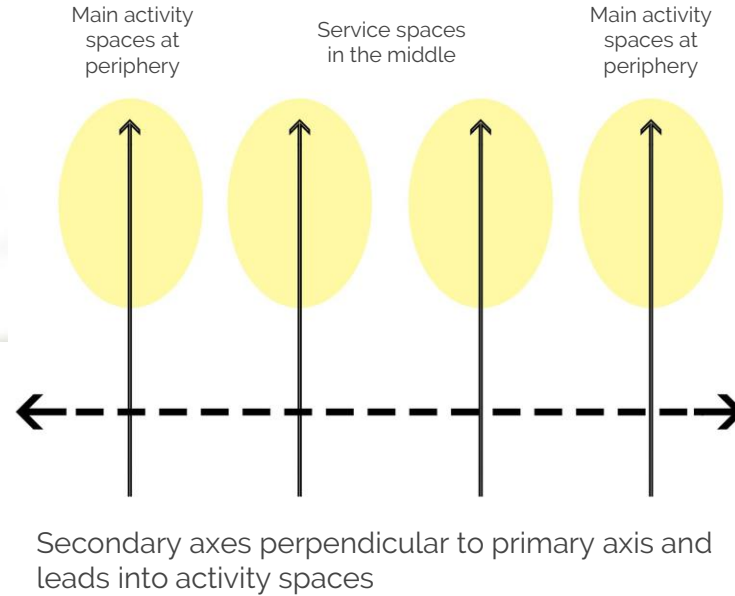
Experience



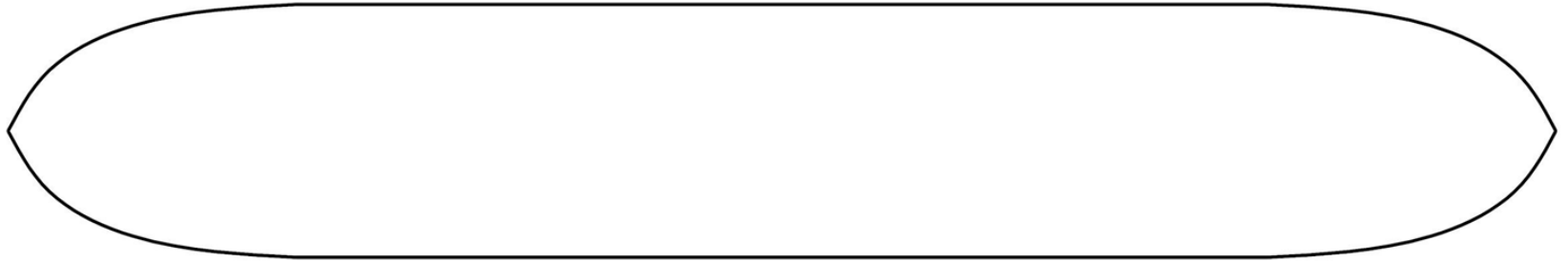
Experience - Concept 1



Traditional Kerala Ekasala House



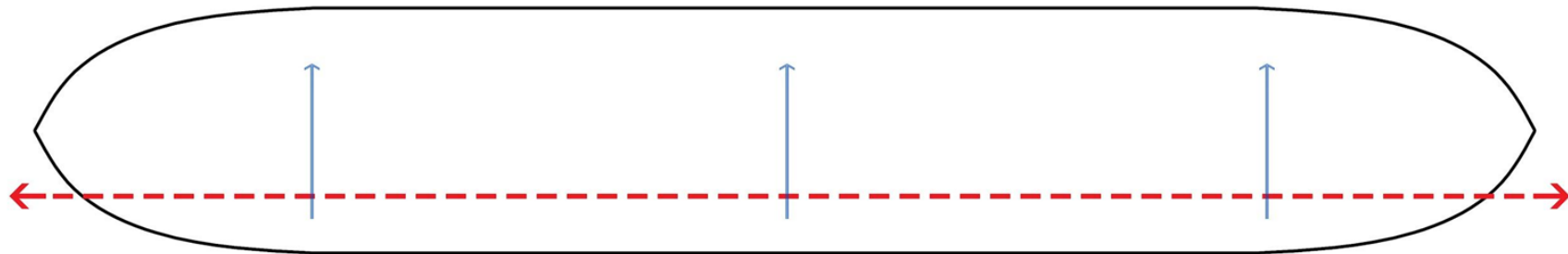
Experience - Concept 1



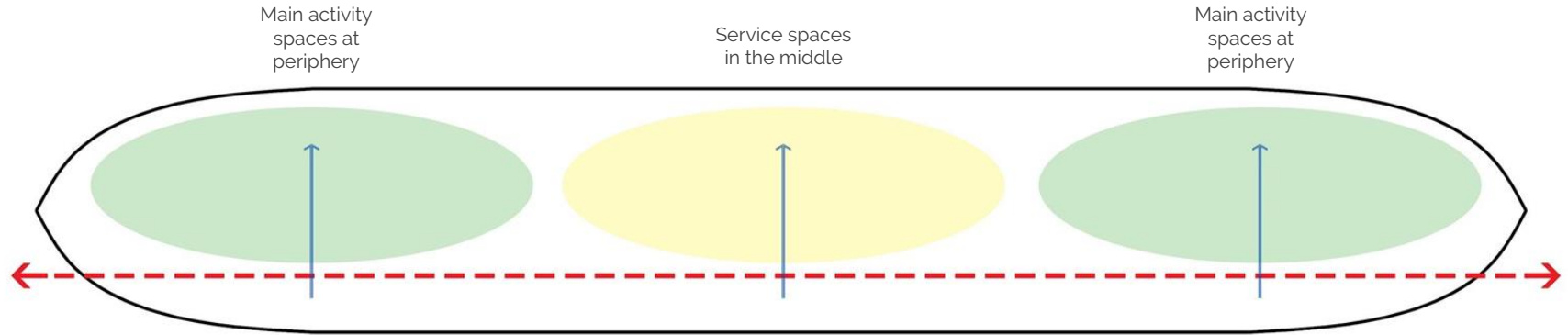
Experience - Concept 1



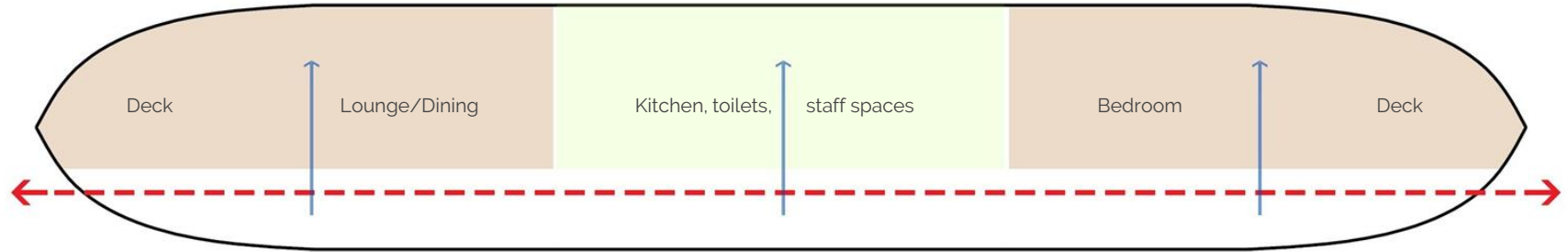
Experience - Concept 1



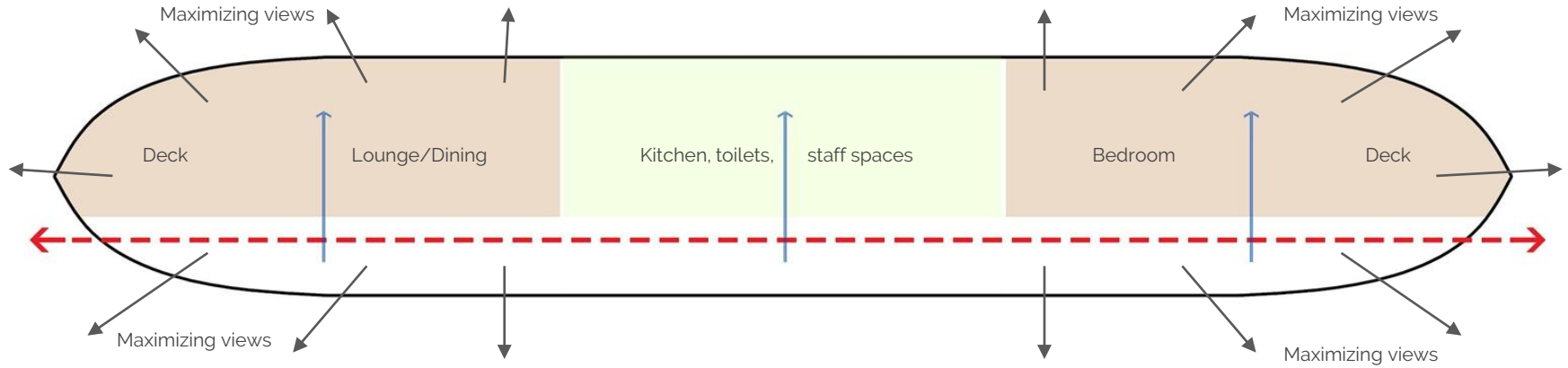
Experience - Concept 1



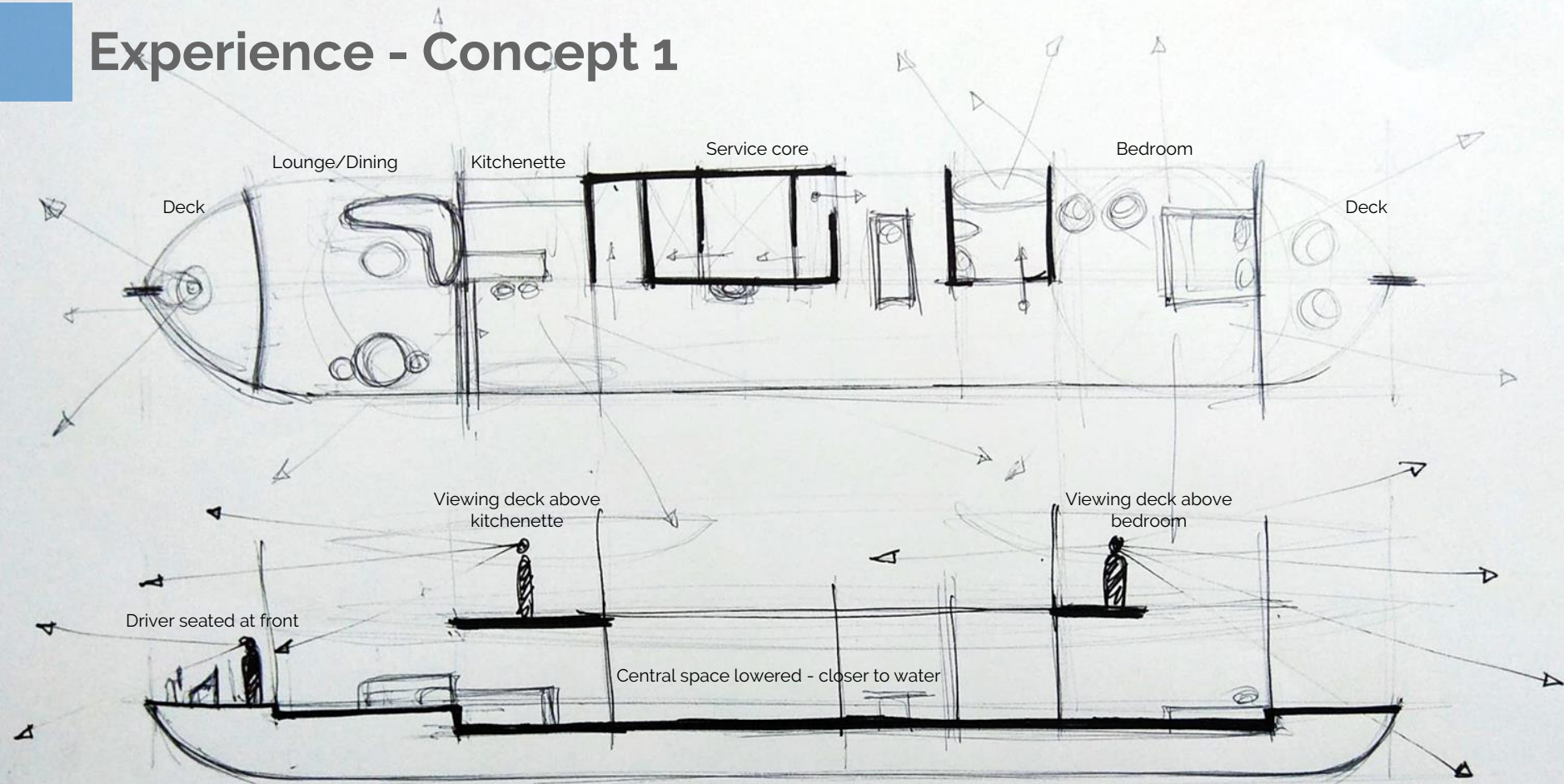
Experience - Concept 1



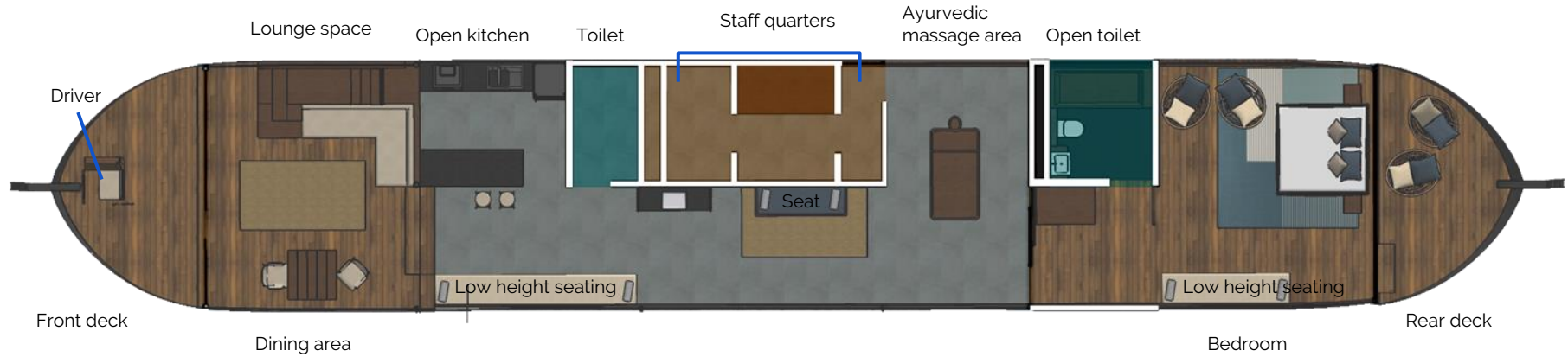
Experience - Concept 1



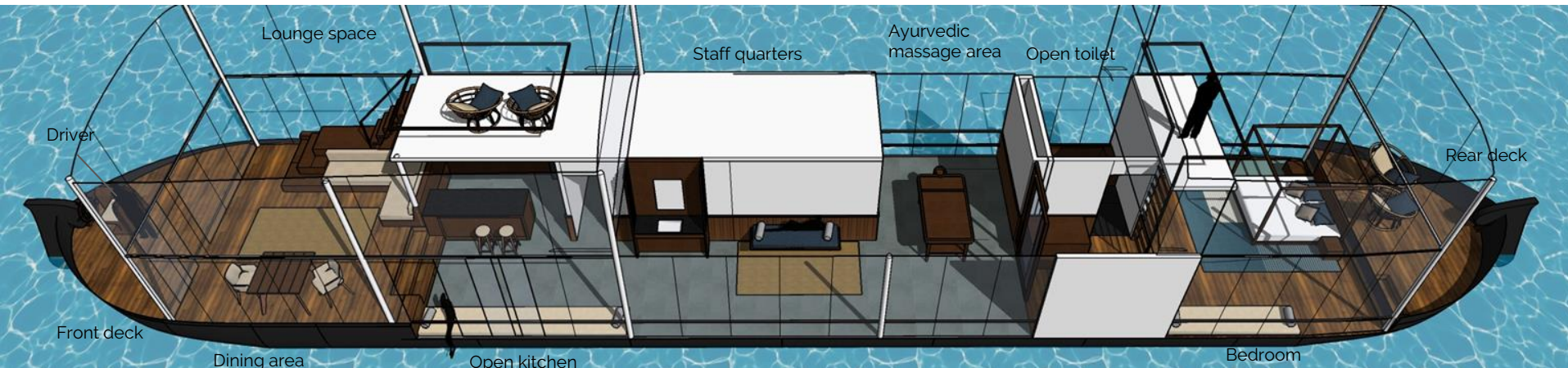
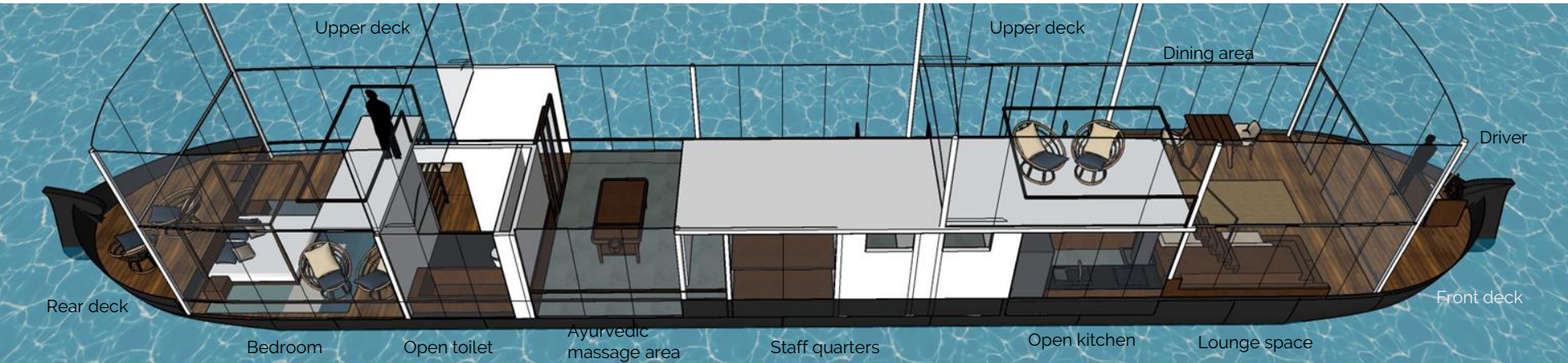
Experience - Concept 1



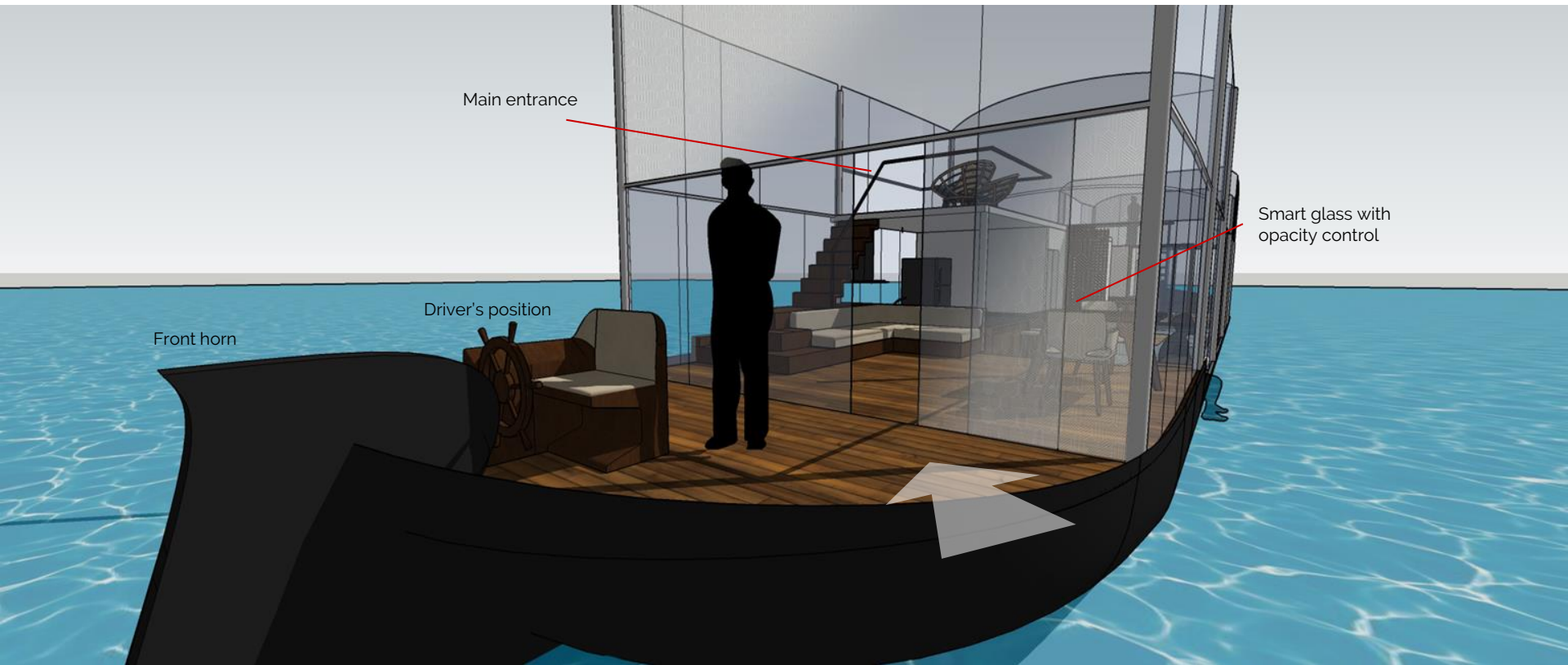
Experience - Concept 1



Experience - Concept 1

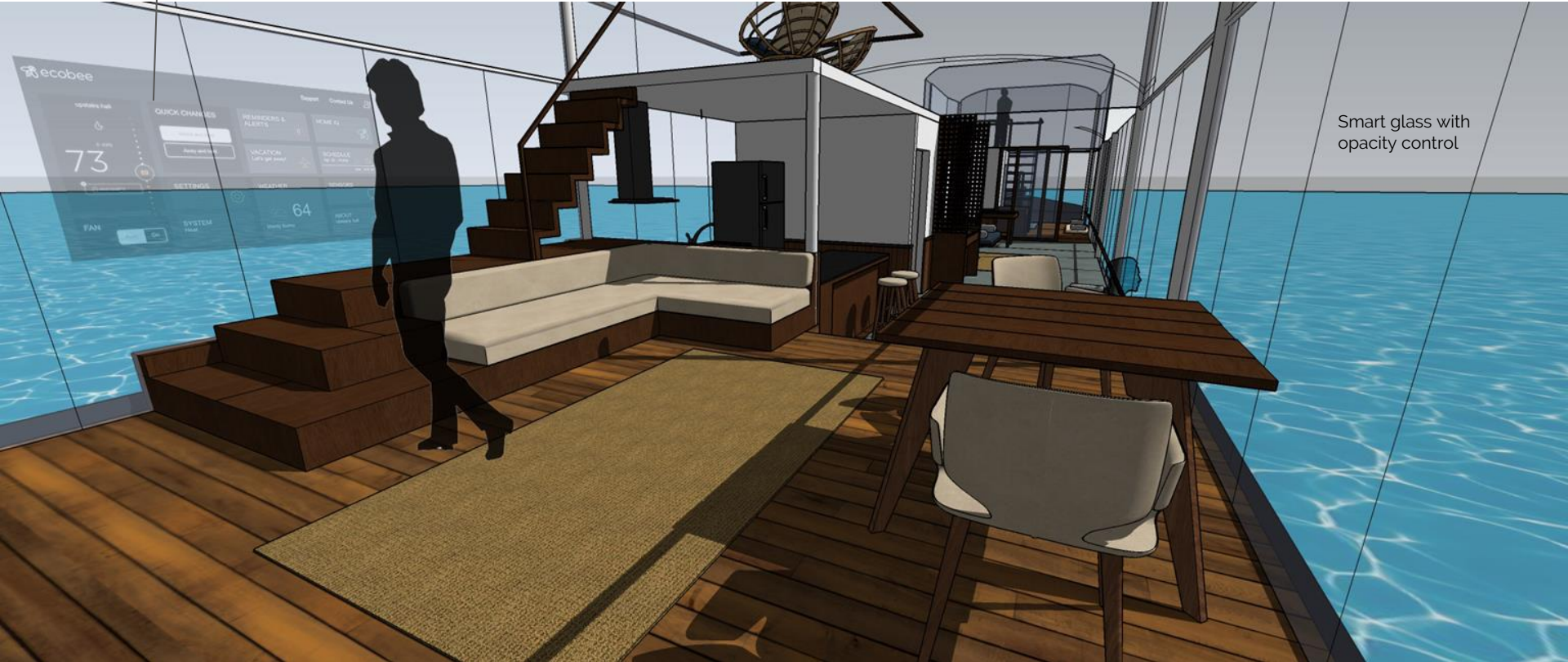


Experience - Concept 1



Experience - Concept 1

Smart screen showing weather data
as per user request



Smart glass with
opacity control

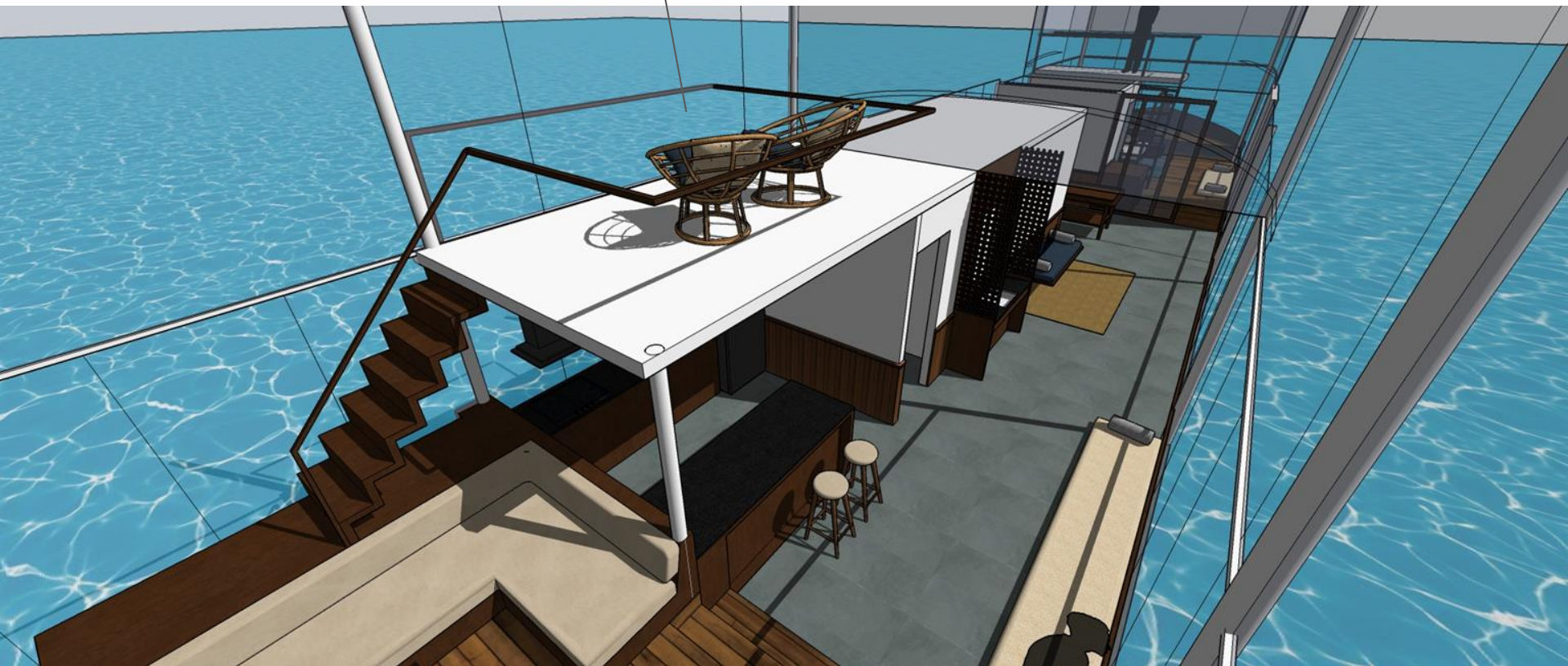
Experience - Concept 1

Smart screen showing live location
and route of boat's journey



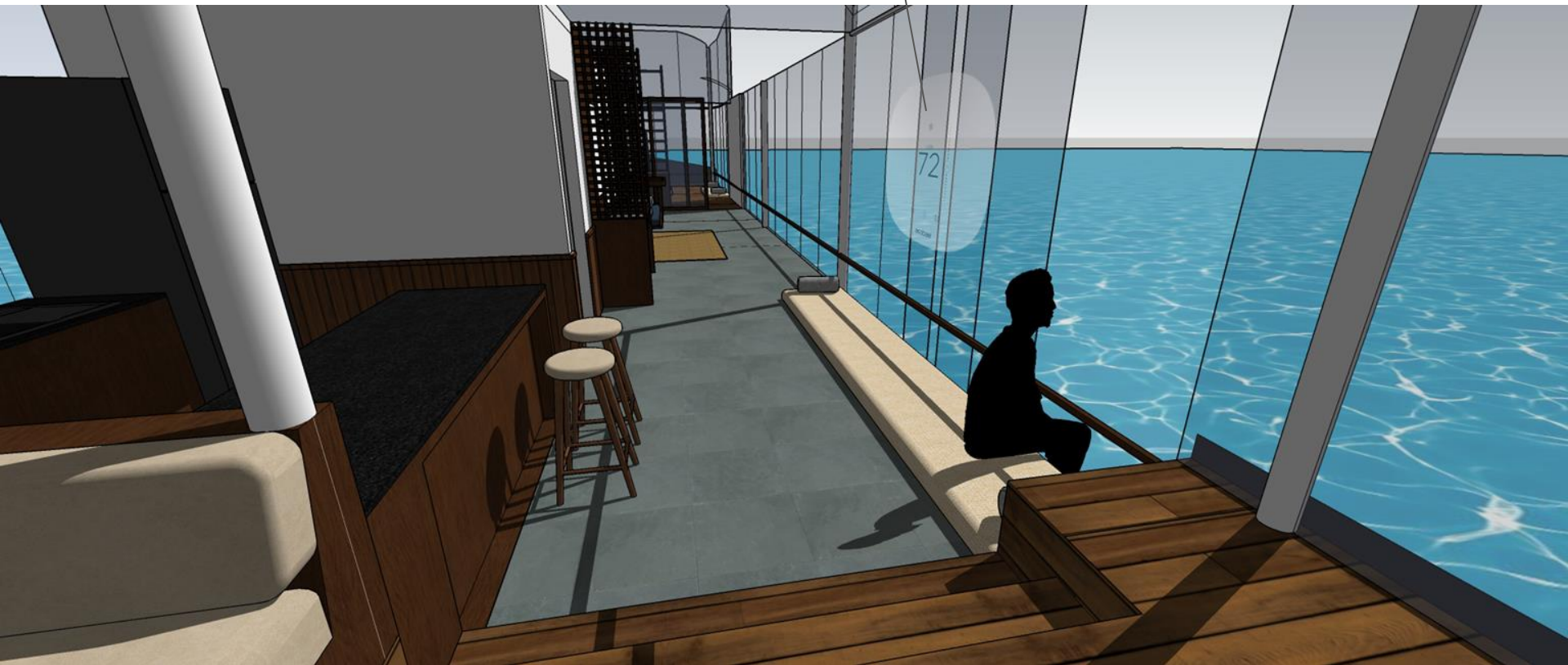
Experience - Concept 1

Deck space above
the kitchenette



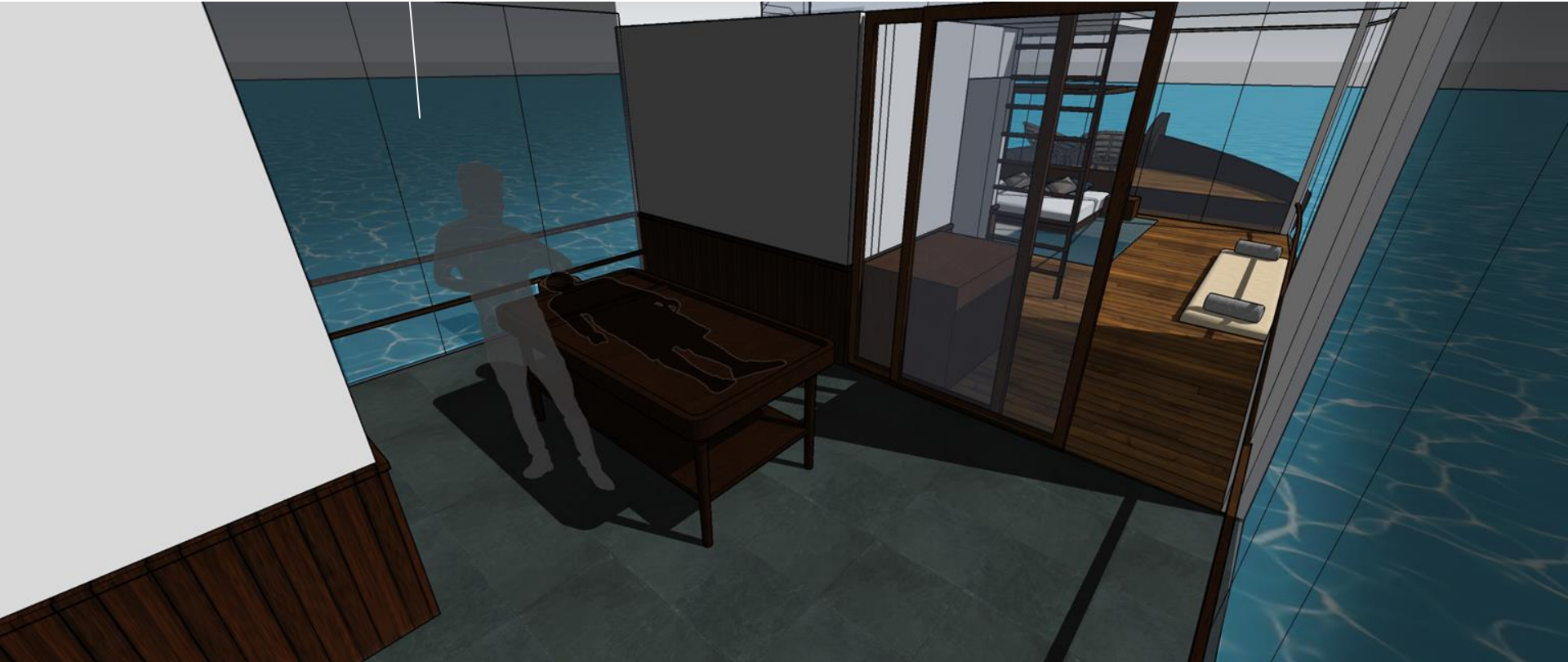
Experience - Concept 1

AI detects user presence and gives
suggestive data via screen



Experience - Concept 1

Opacity of glass controlled to limit
light entry into space while
massage is going on



Experience - Concept 1

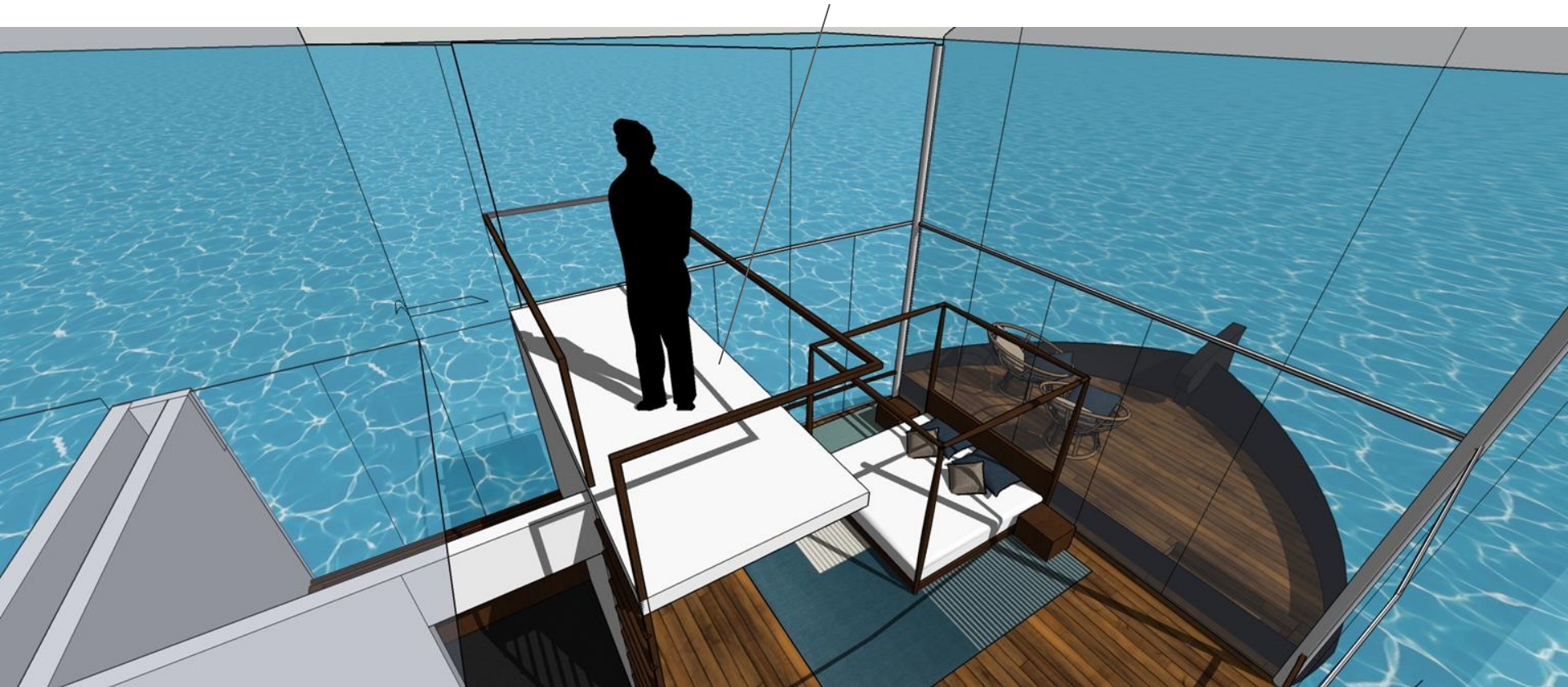
Ladder to access view deck
on upper level

Bedroom allows maximum view -
star gazing at night



Experience - Concept 1

Viewing deck accessed from
bedroom - full 360 view

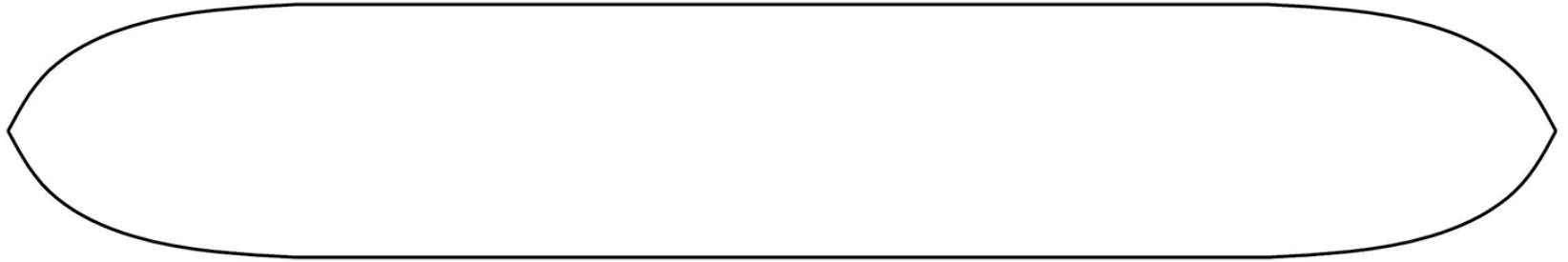


Experience - Concept 1

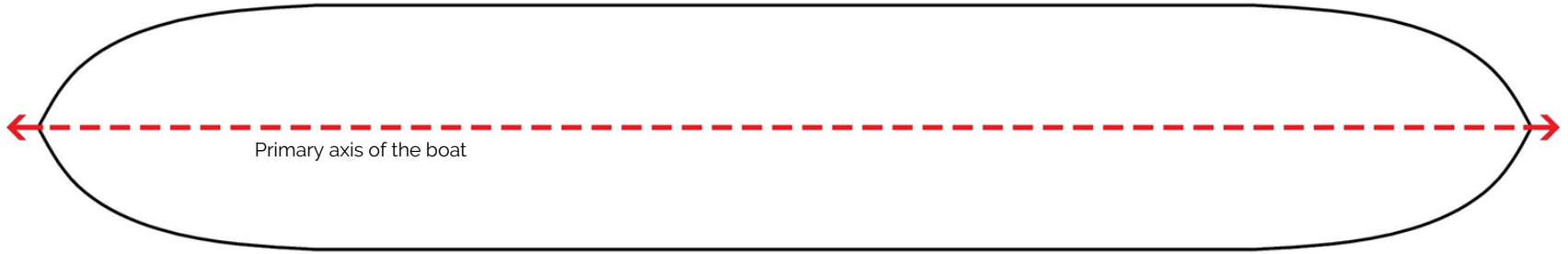
Enjoy sunsets at
the rear deck



Experience - Concept 2



Experience - Concept 2



Experience - Concept 2

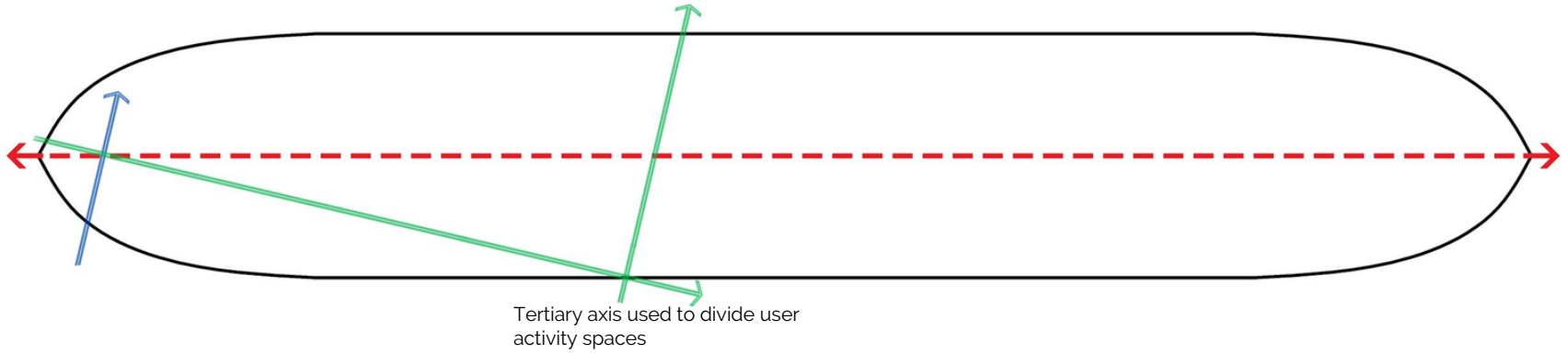


Experience - Concept 2

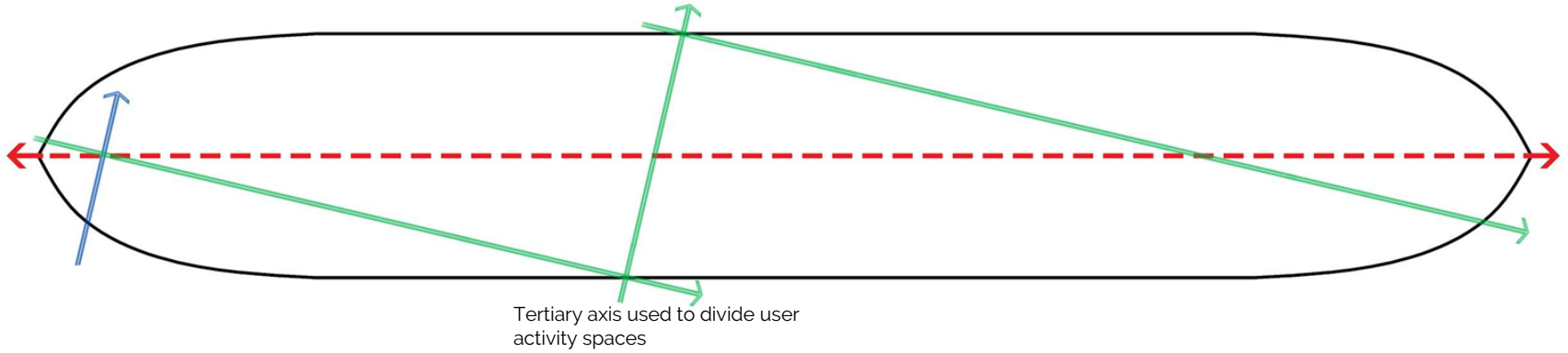


Tertiary axis used to divide user activity spaces

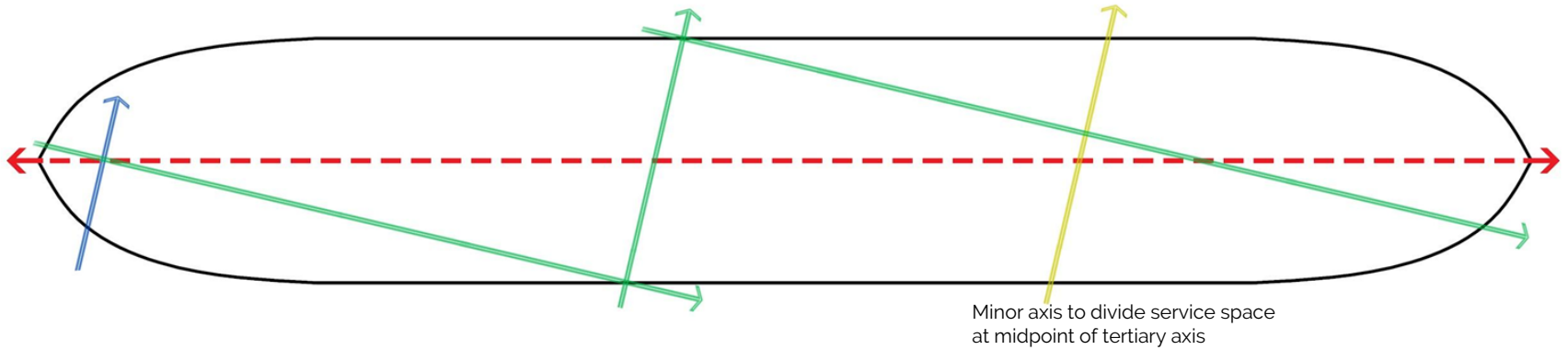
Experience - Concept 2



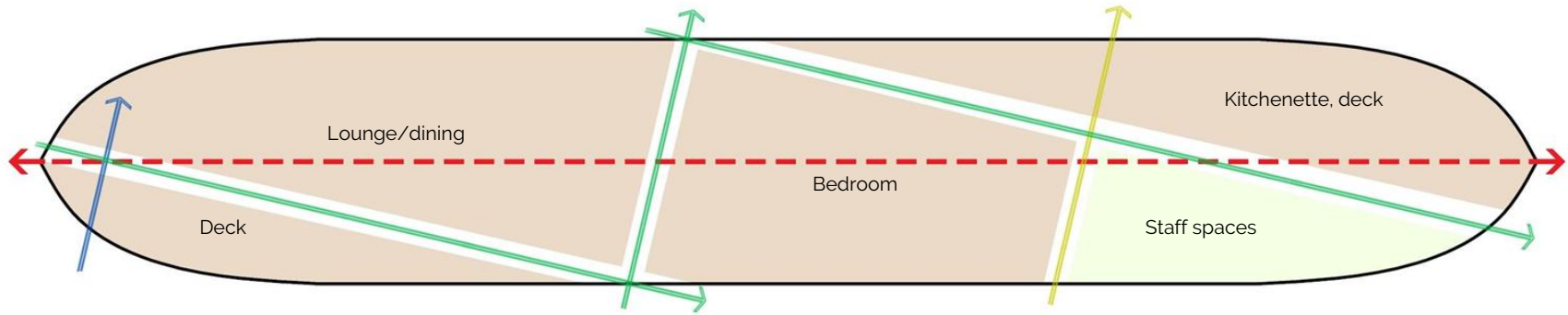
Experience - Concept 2



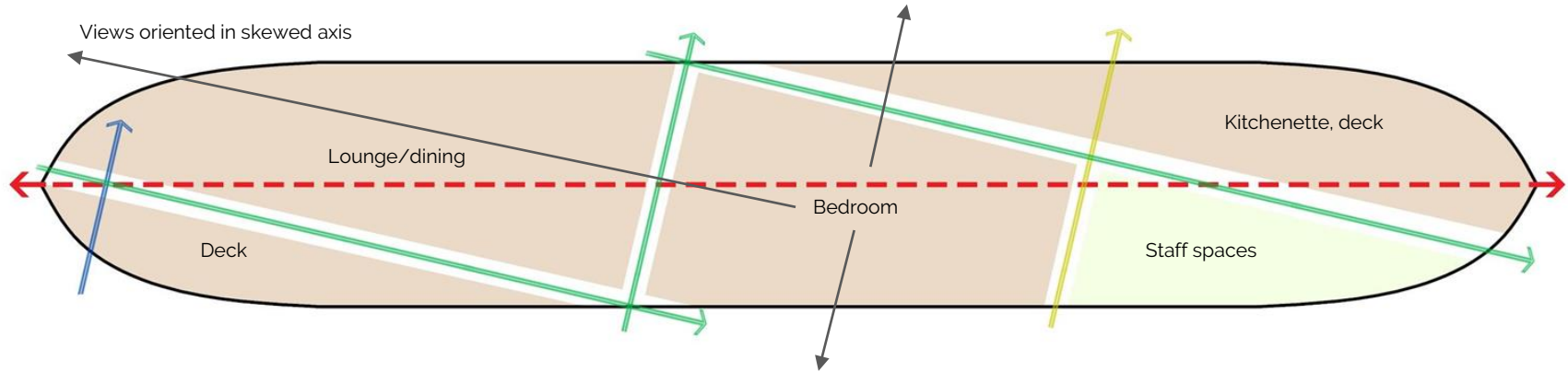
Experience - Concept 2



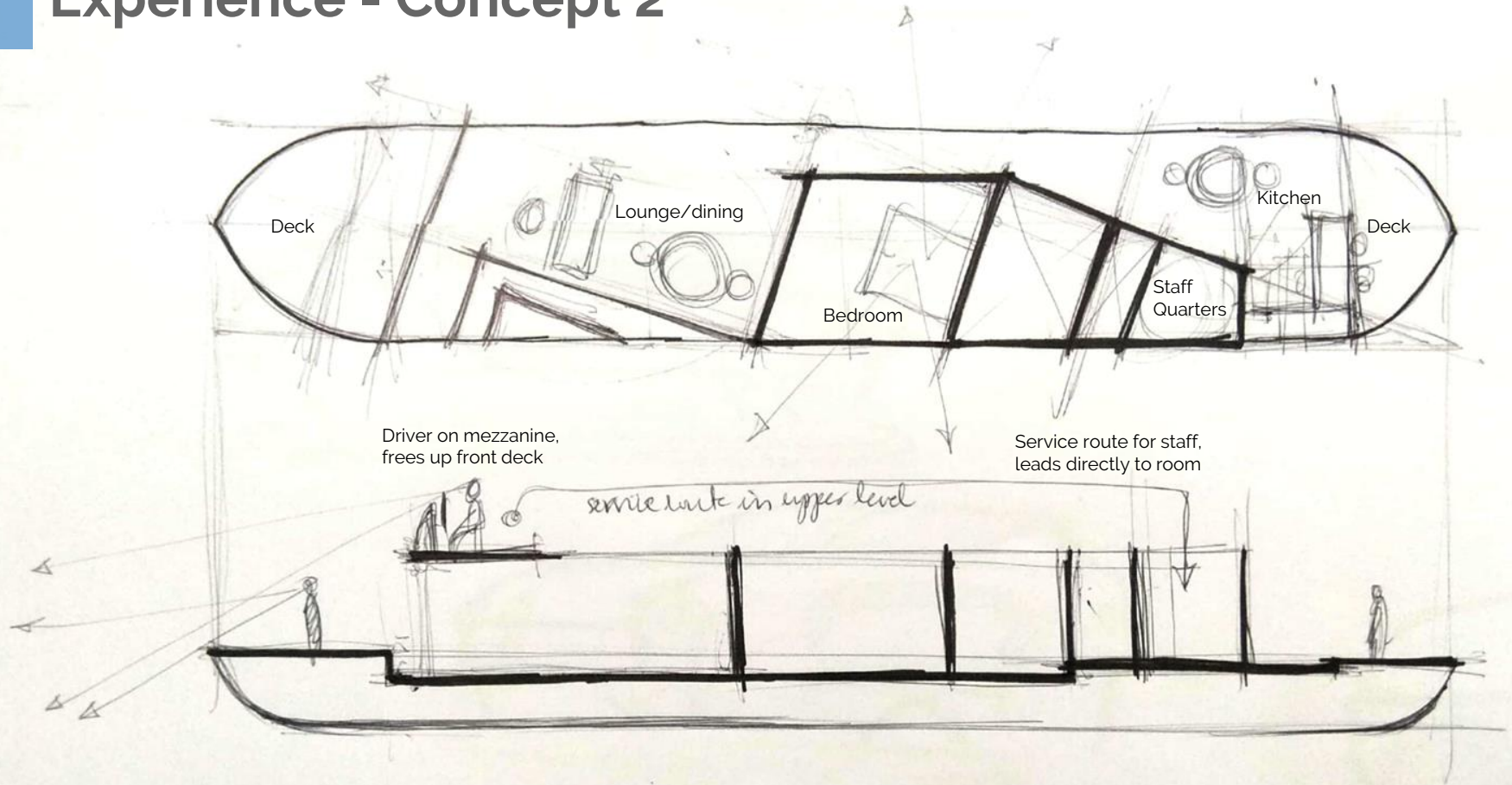
Experience - Concept 2



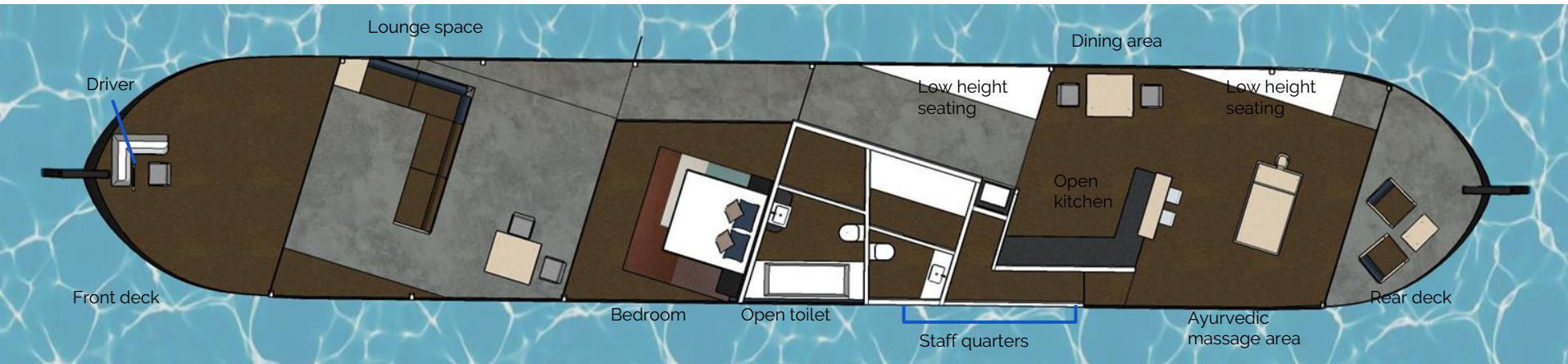
Experience - Concept 2



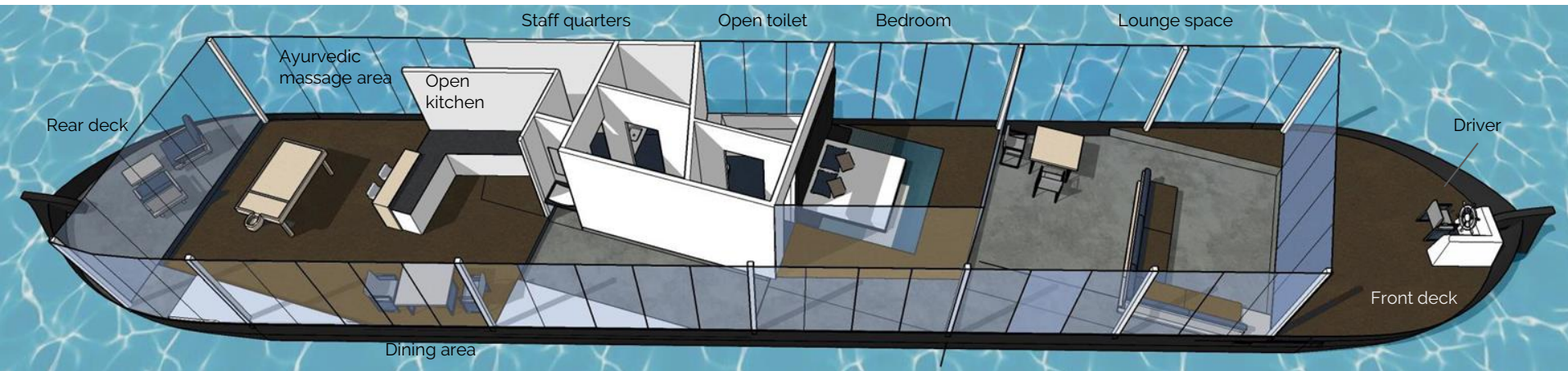
Experience - Concept 2



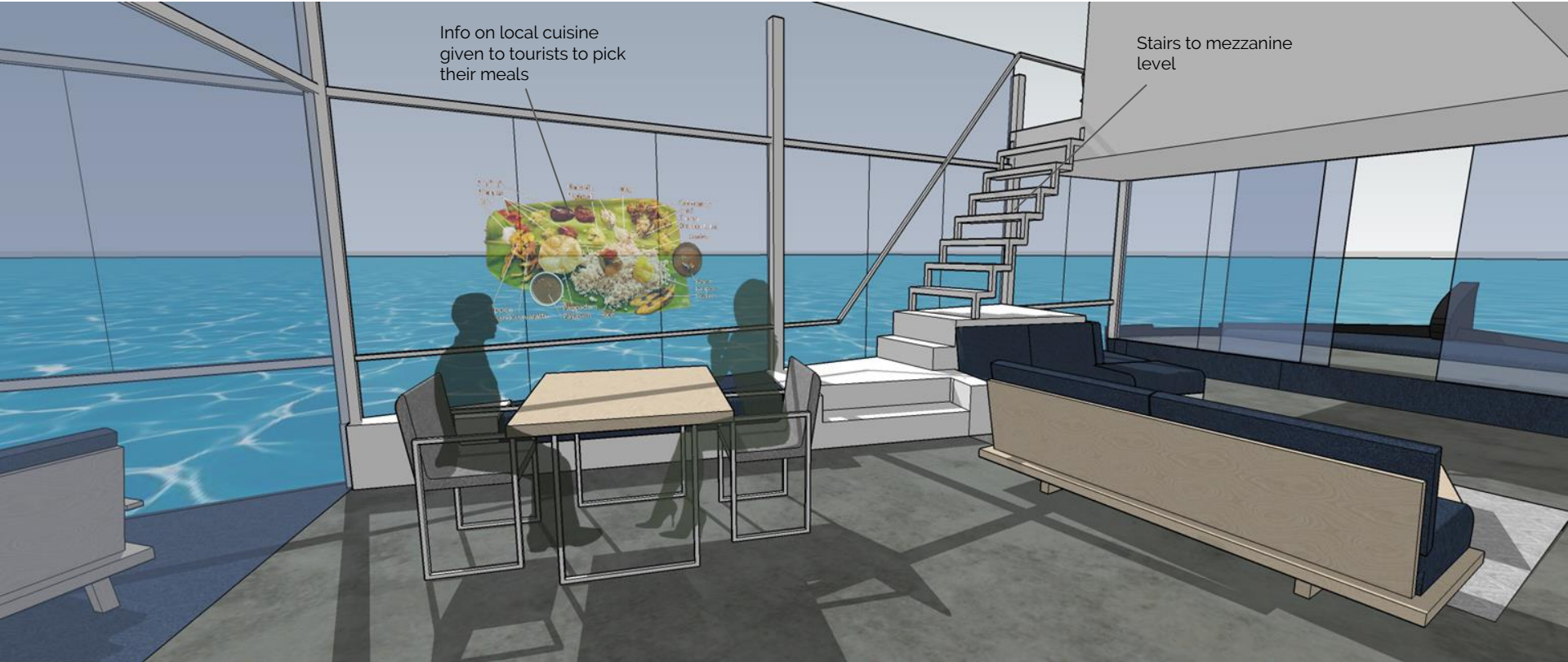
Experience - Concept 2



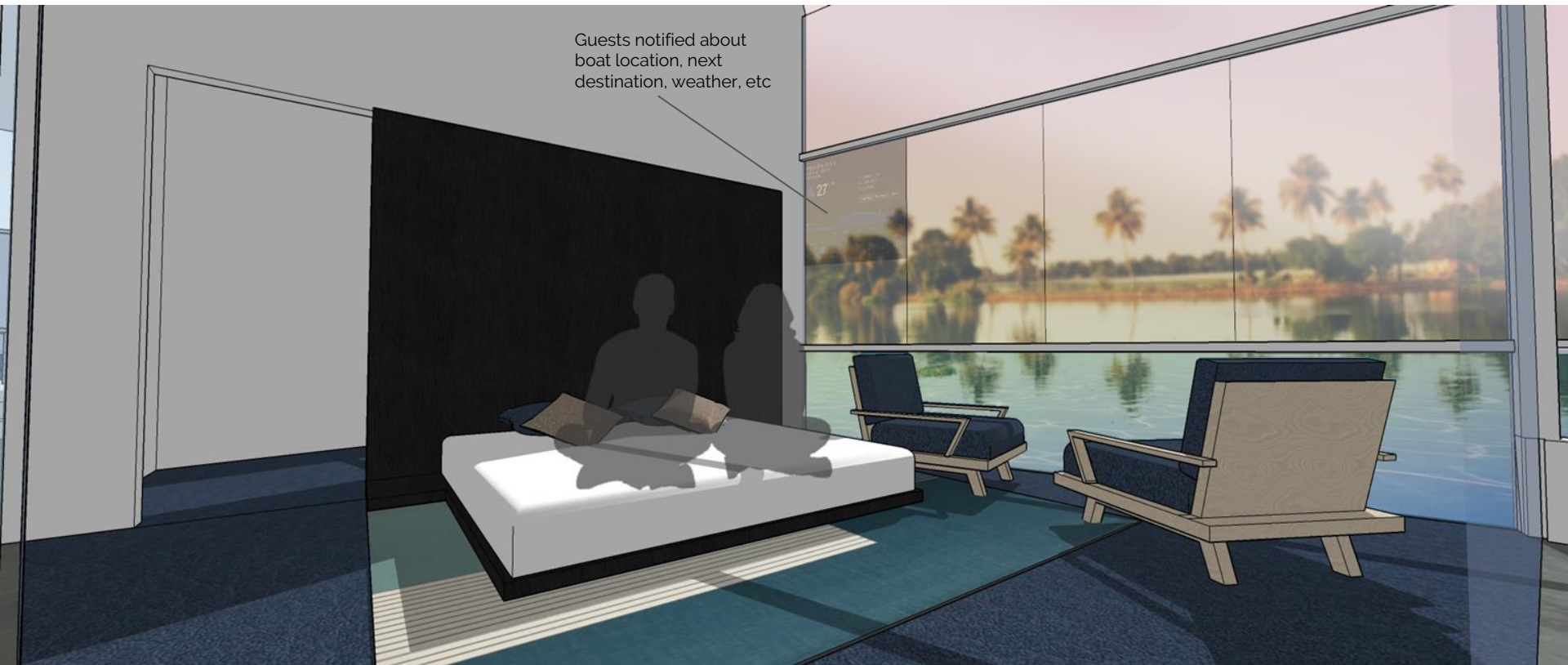
Experience - Concept 2



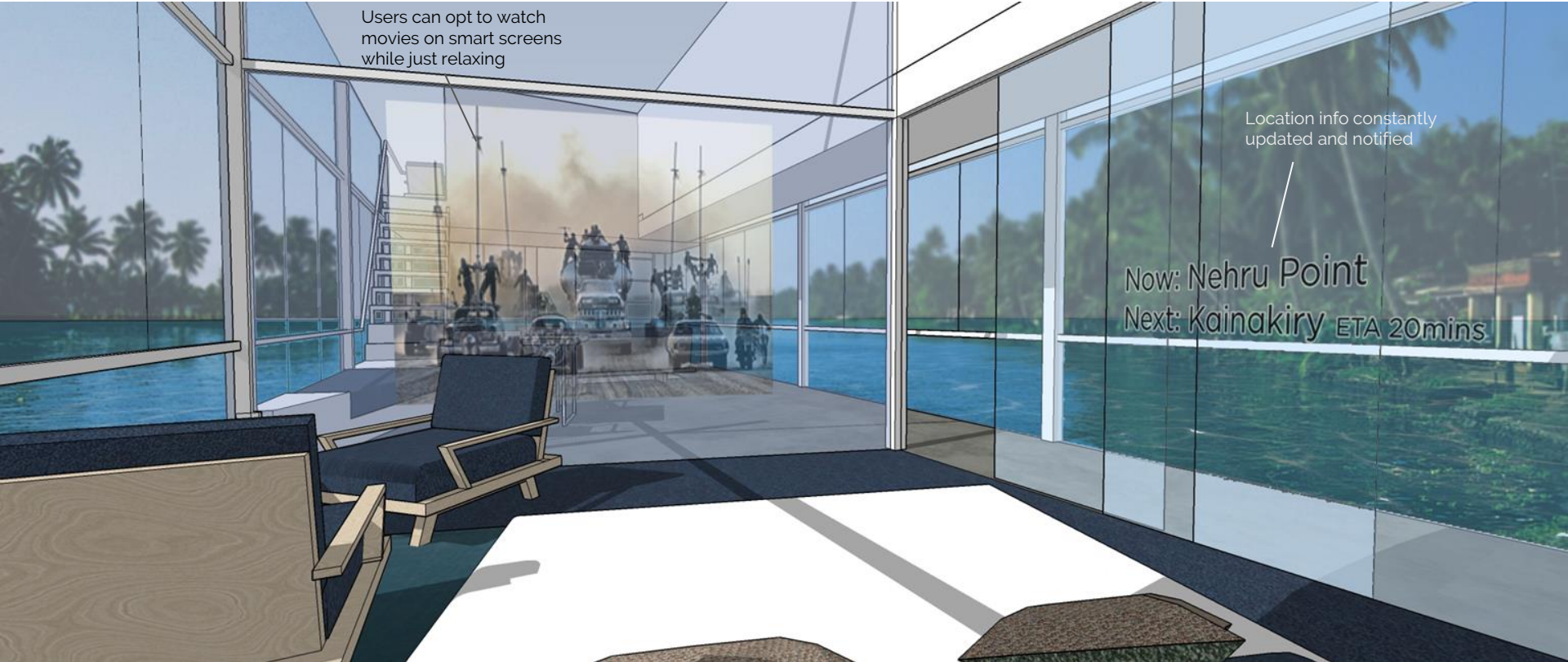
Experience - Concept 2



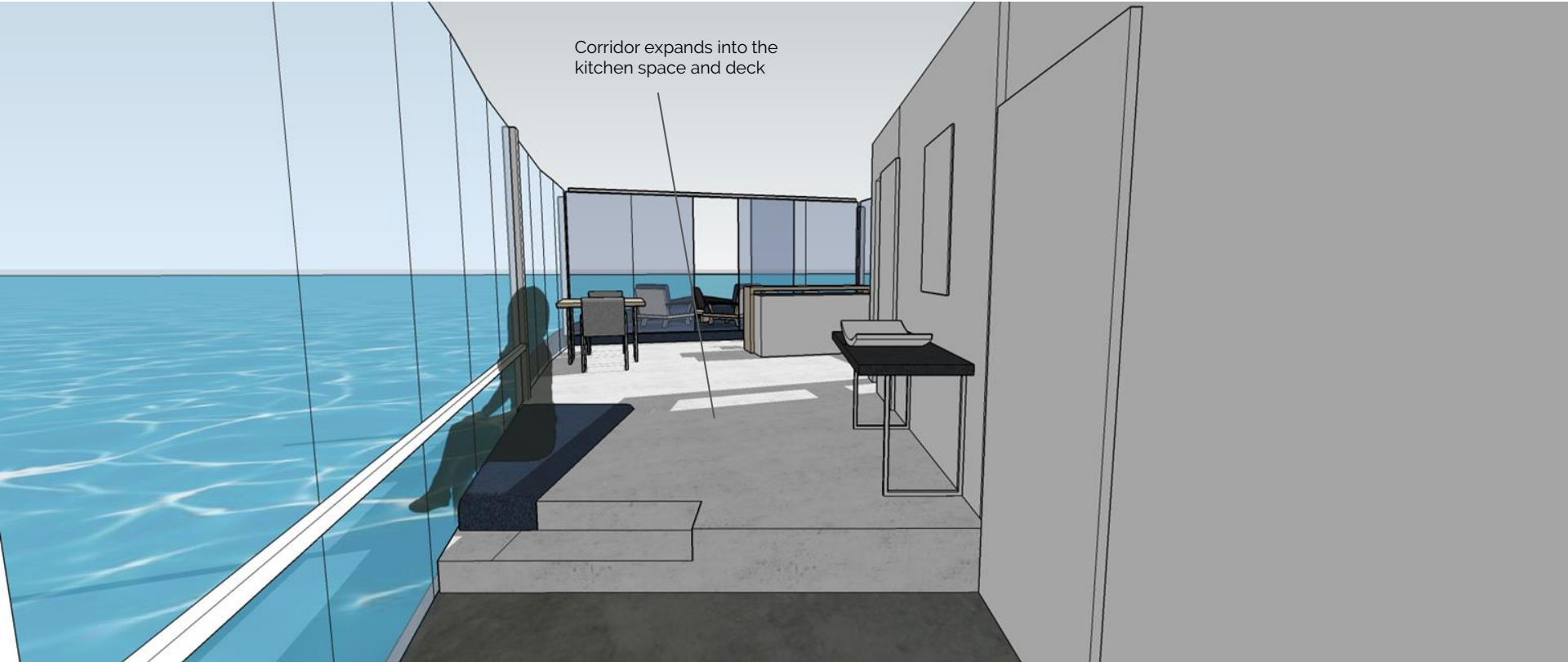
Experience - Concept 2



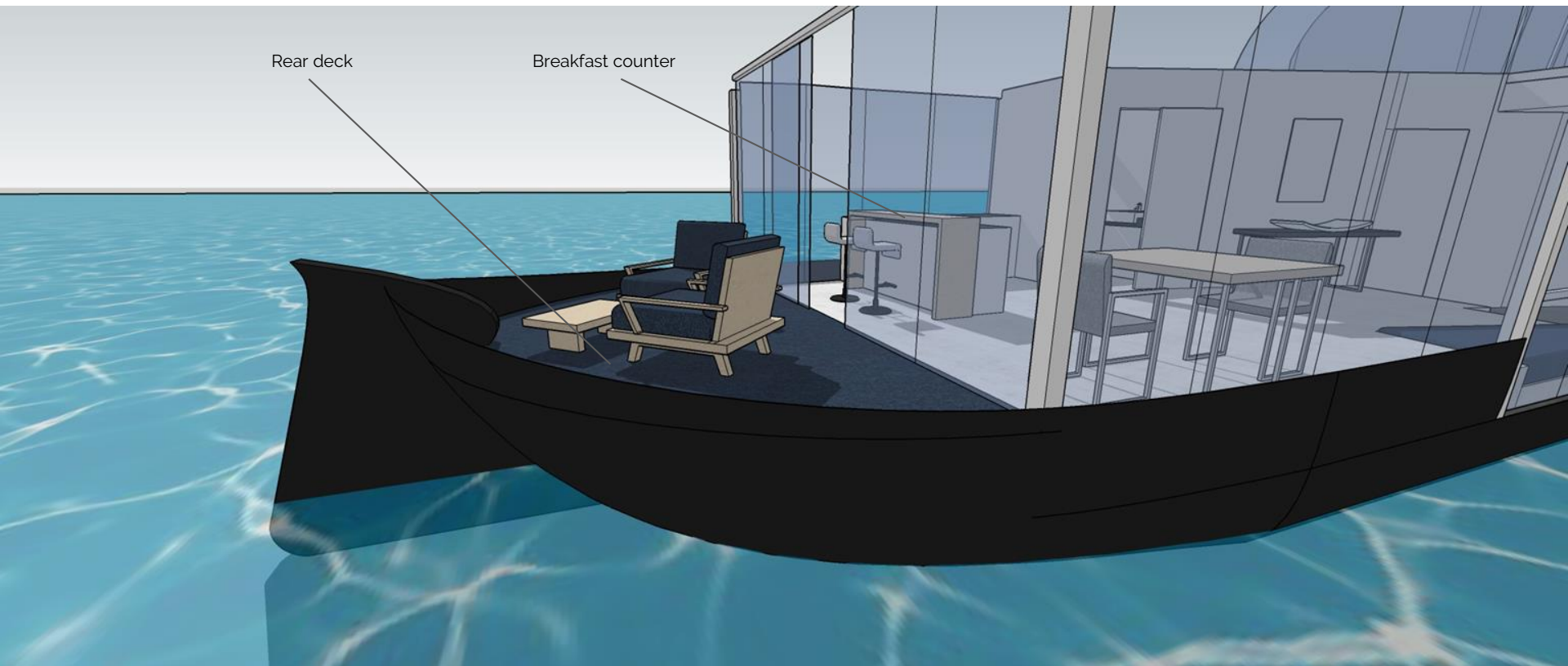
Experience - Concept 2



Experience - Concept 2



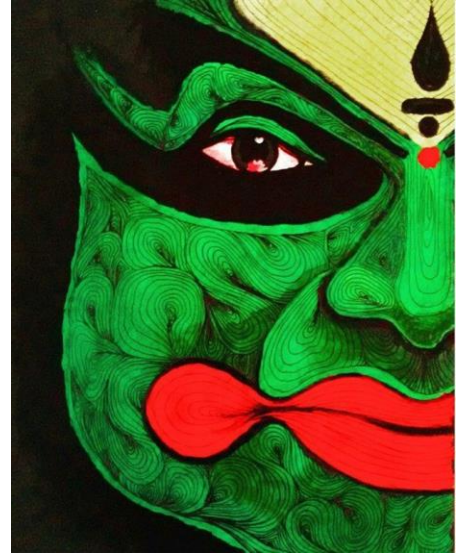
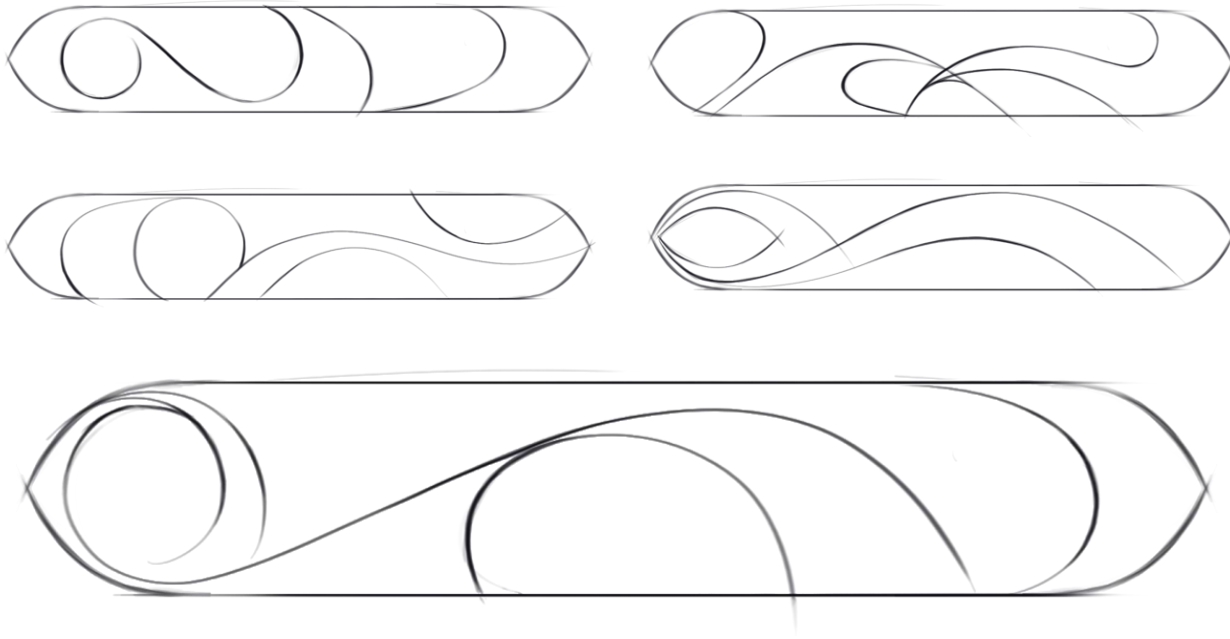
Experience - Concept 2



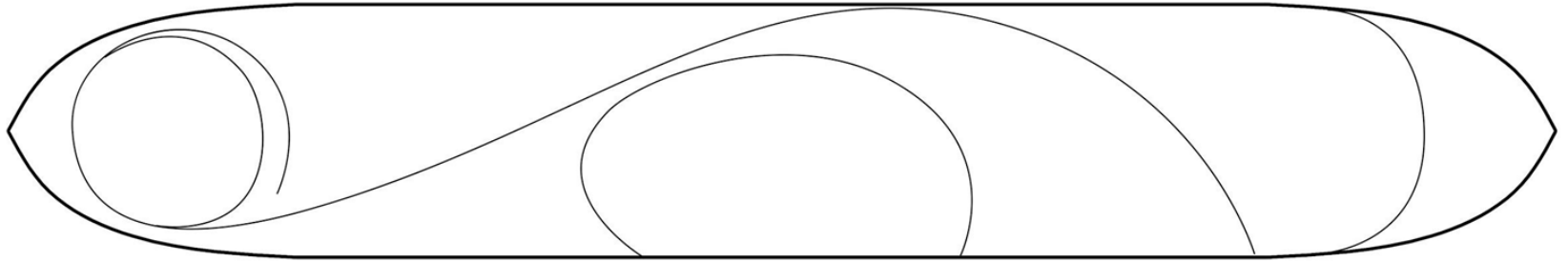
Experience - Concept 3

Kathakali - Traditional Kerala artform

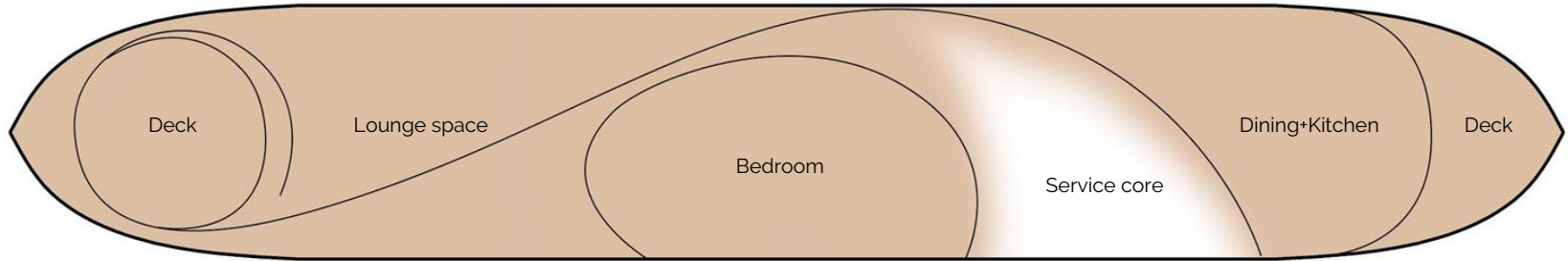
Major feature - **Painted faces with colourful patterns**



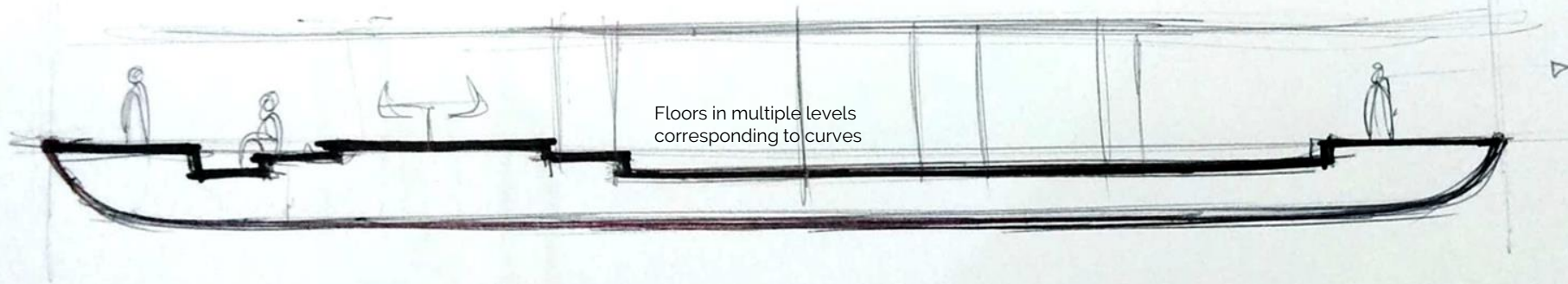
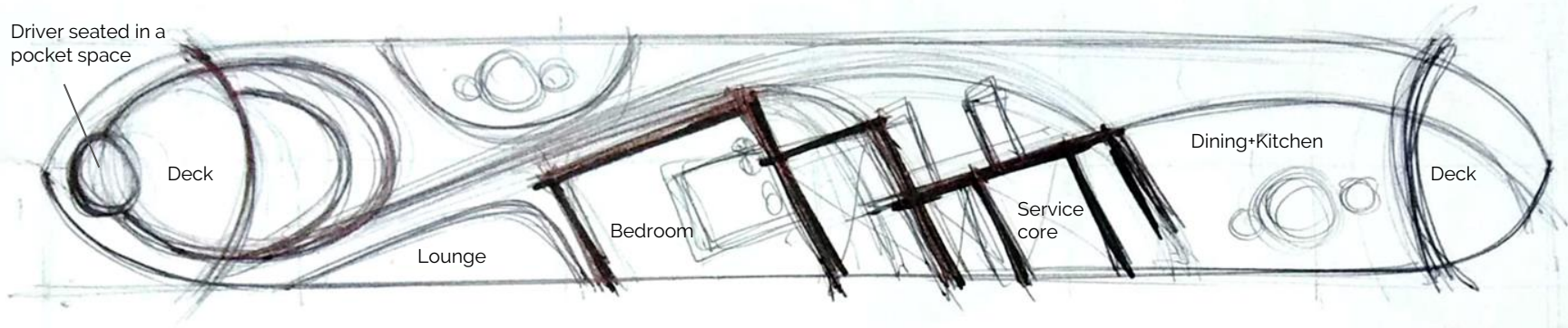
Experience - Concept 3



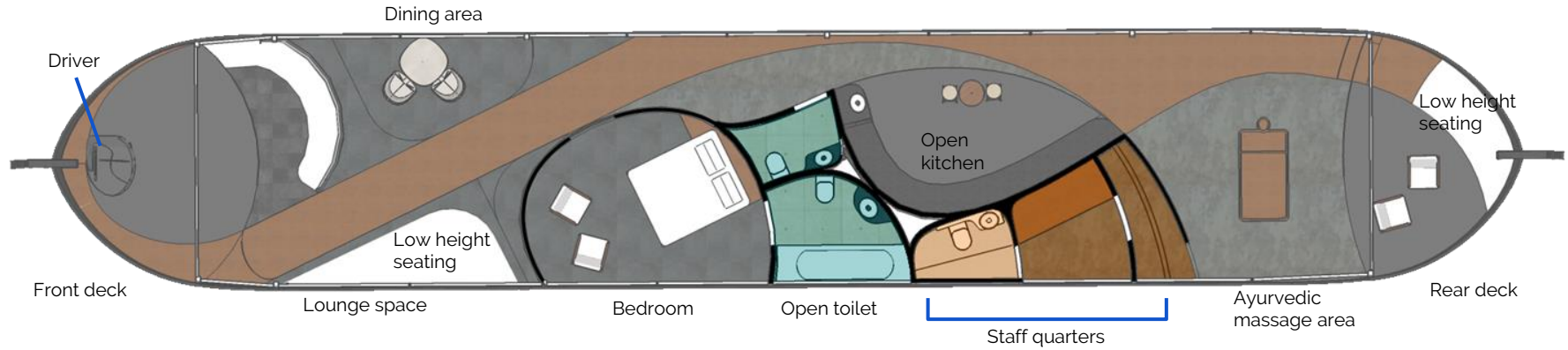
Experience - Concept 3



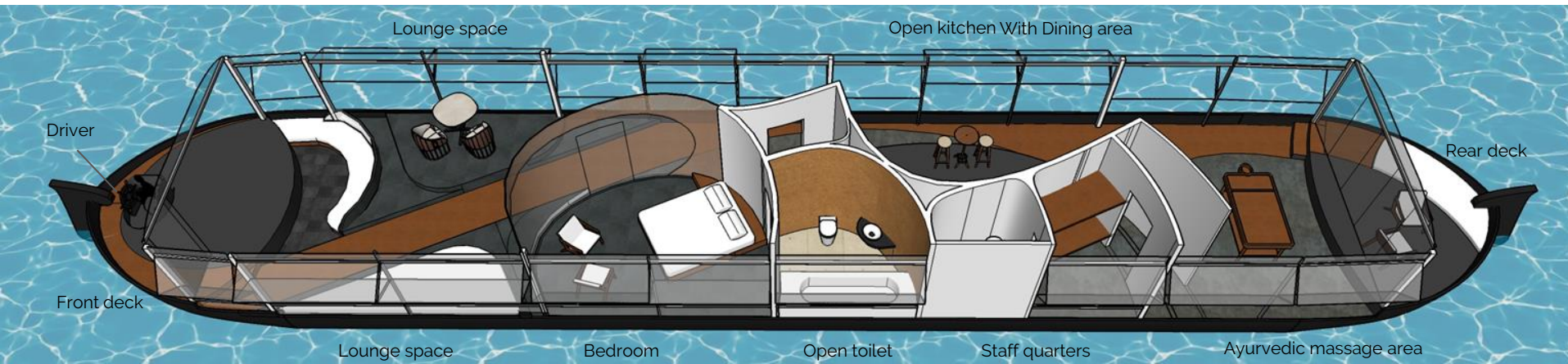
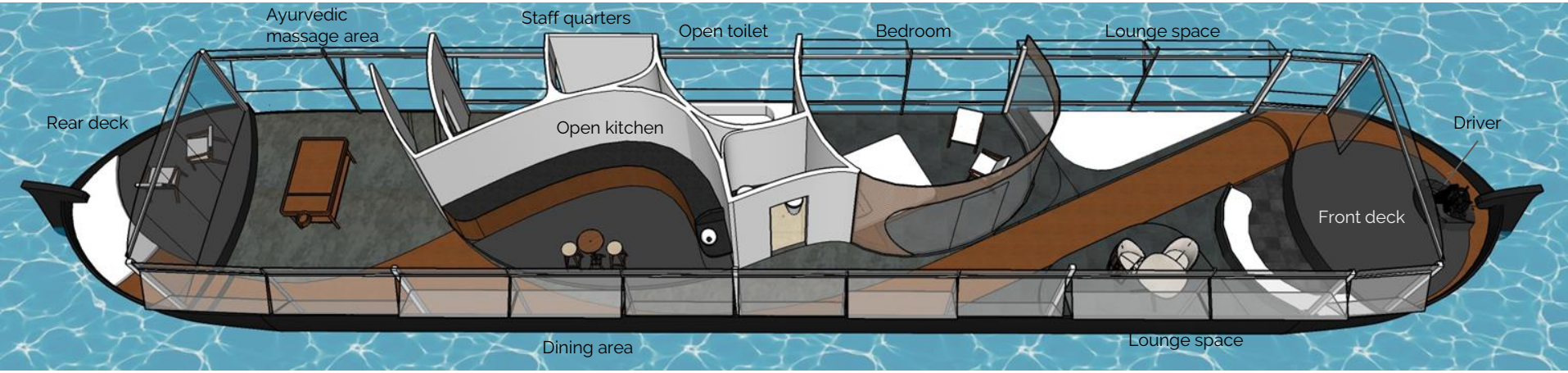
Experience - Concept 3



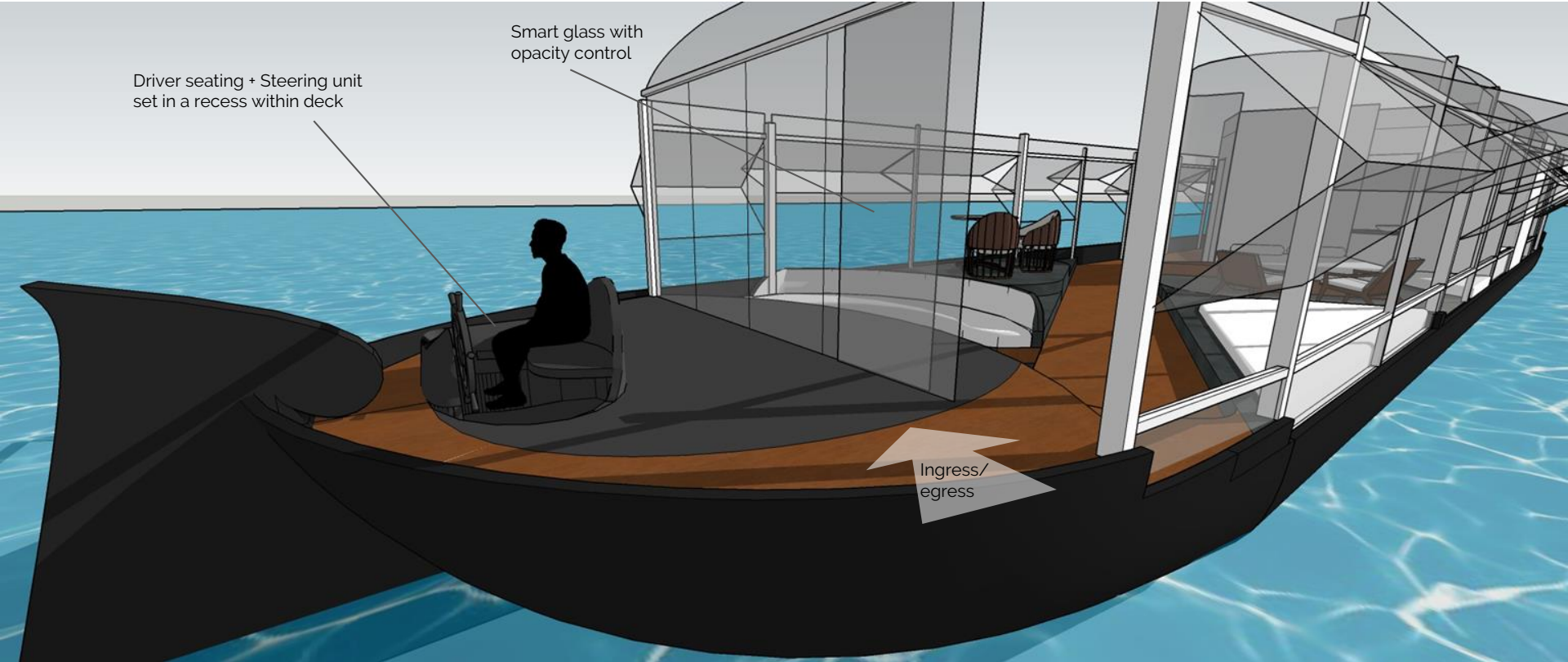
Experience - Concept 3



Experience - Concept 3



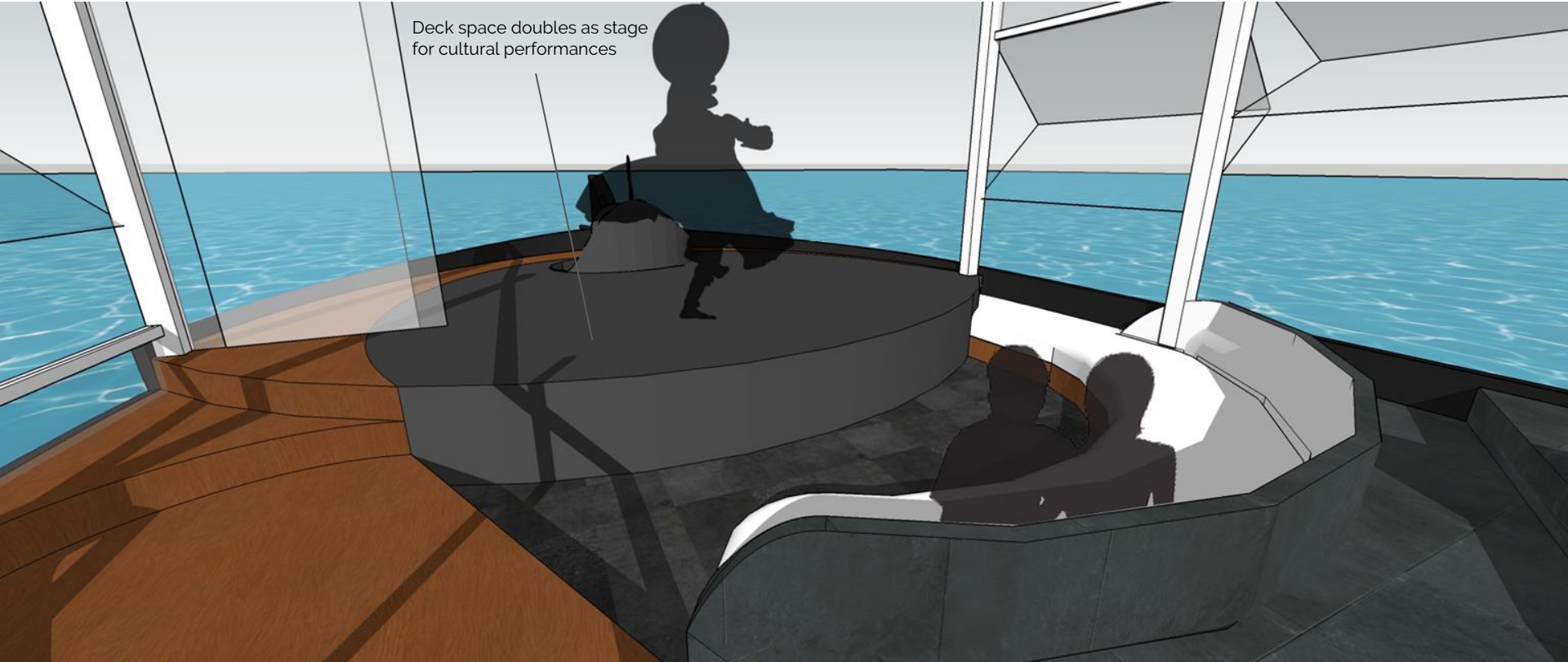
Experience - Concept 3



Experience - Concept 3



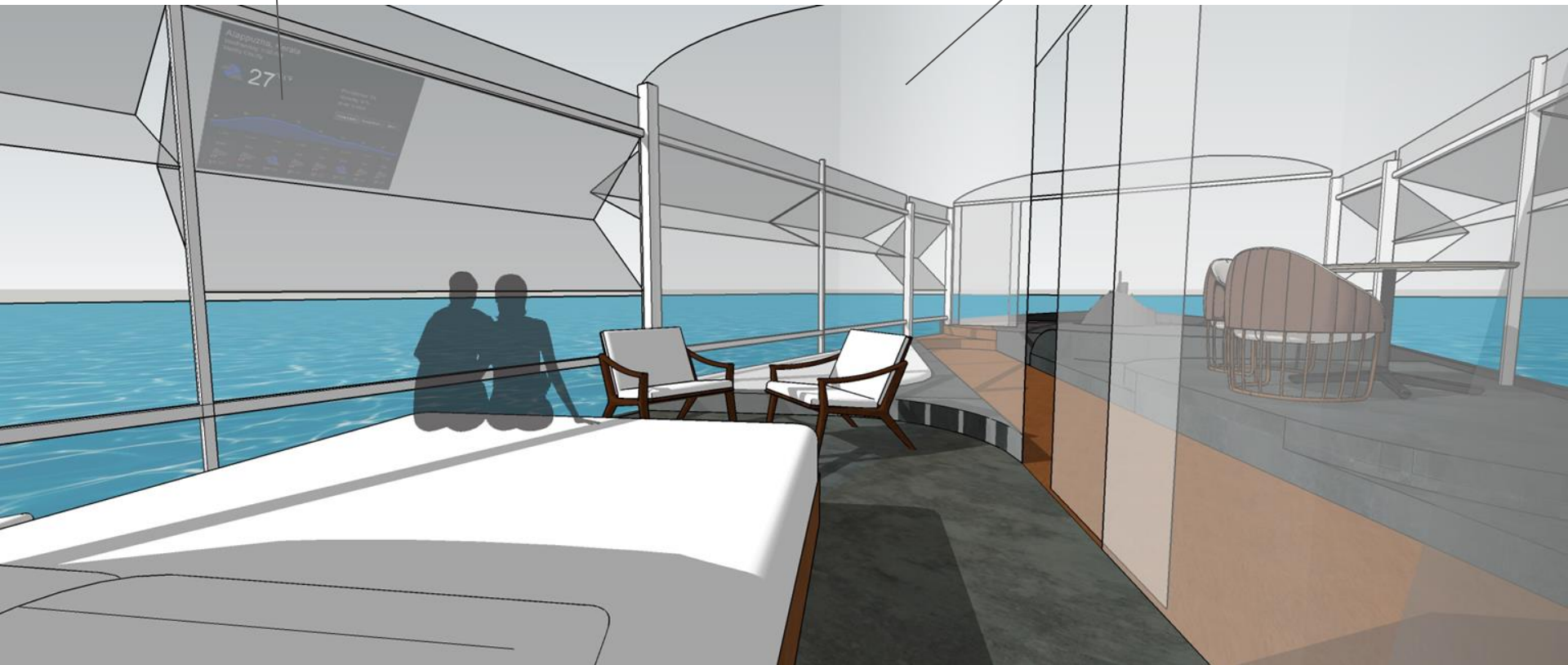
Experience - Concept 3



Experience - Concept 3

Weather, location details, etc
displayed glass where user
proximity is detected

Curved wall of the bedroom
with smart glass



Experience - Concept 3

Weather, location details, etc
displayed glass where user
proximity is detected

Users can enjoy movies in
privacy after increasing opacity
of the smart glass



Experience - Concept 3

Weather, location details, etc
displayed glass where user
proximity is detected

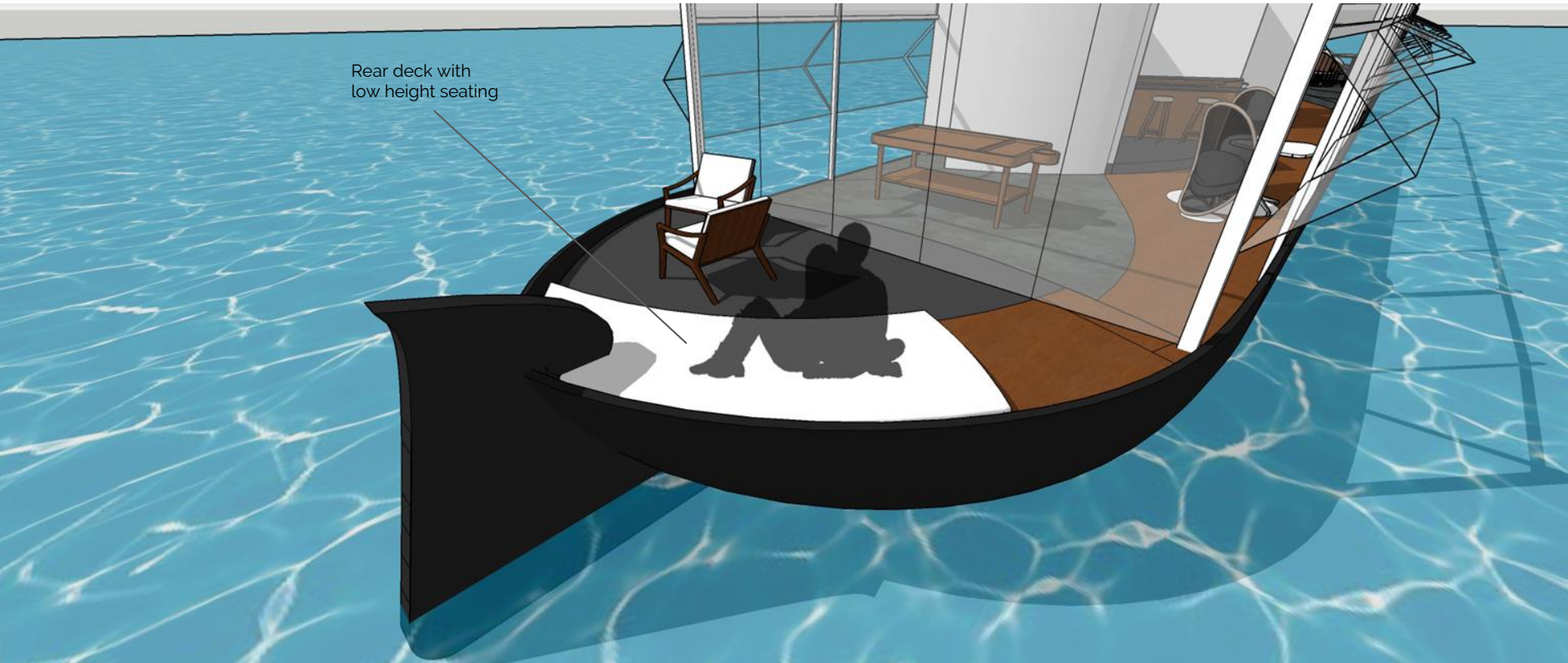
Enjoy night skies from bedroom
itself



Experience - Concept 3



Experience - Concept 3



Experience - User evaluation of concepts

- Which one do you think reflects the idea & essence of Kerala, but gives you a new and modern experience?
- How relaxing the user finds these spaces (rate 1-5)
- Which one does the user think gives them maximum views
- Which one would the user pick if the user were to go for a 1 day cruise.

Concept 1
Concept 3

6

16

3.4

3.6

6

9

8

7

Concept 2

5

3.7

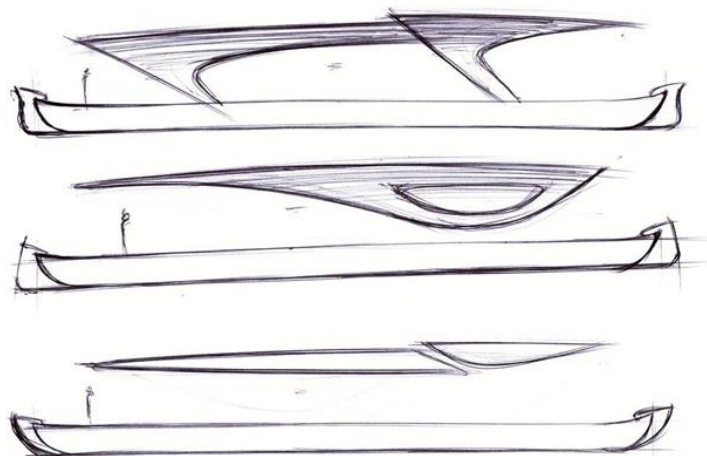
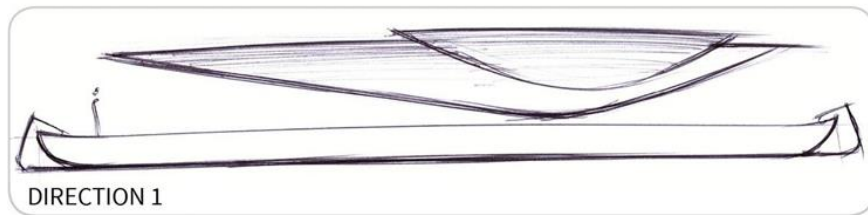
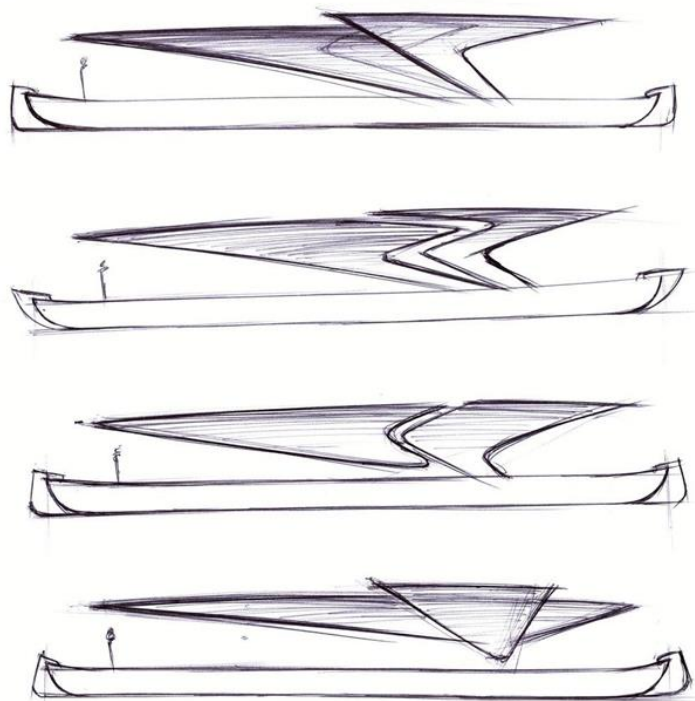
12

12

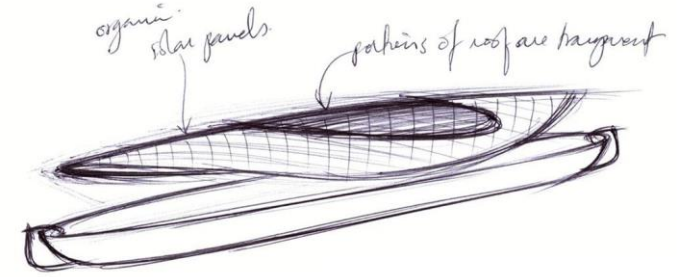
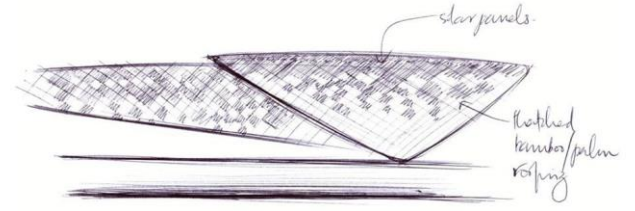
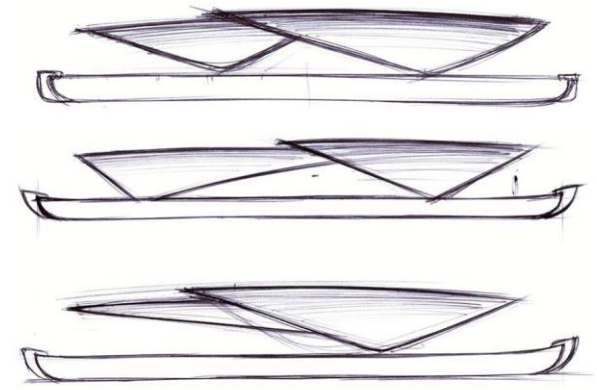
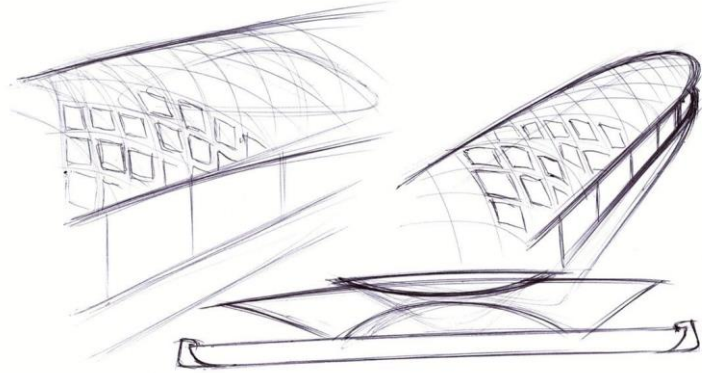
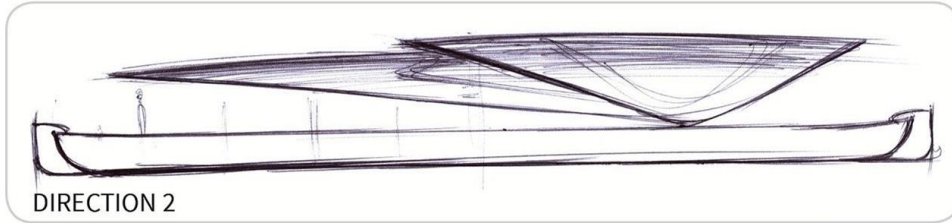
Form - Mood board



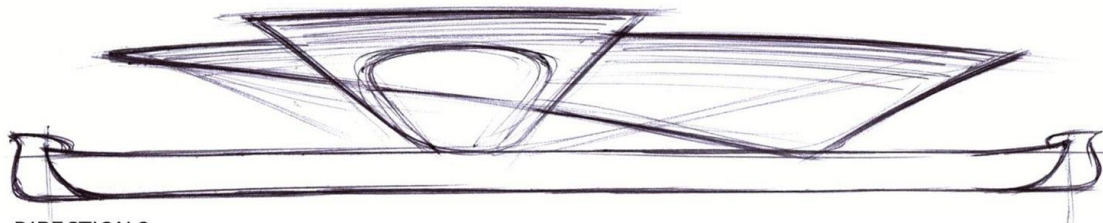
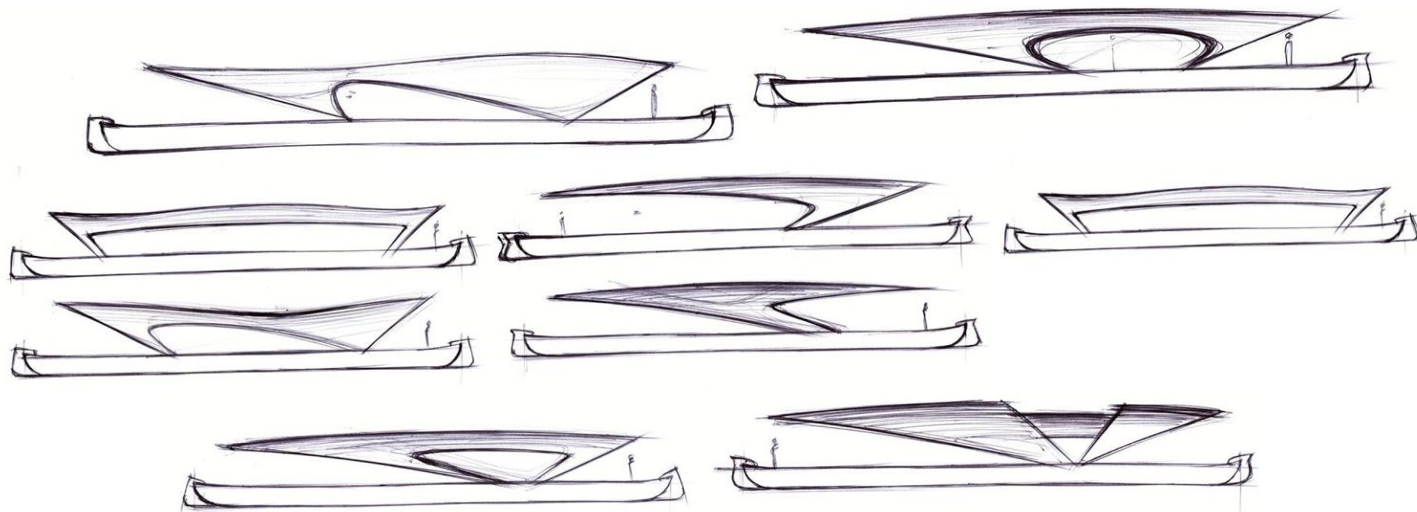
Form - Ideations



Form - Ideations

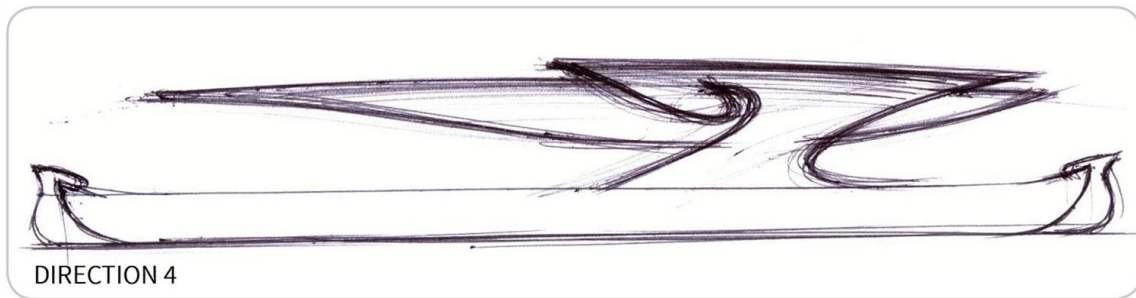
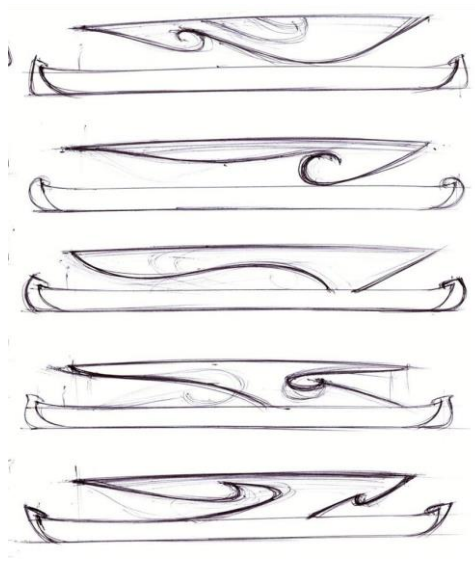
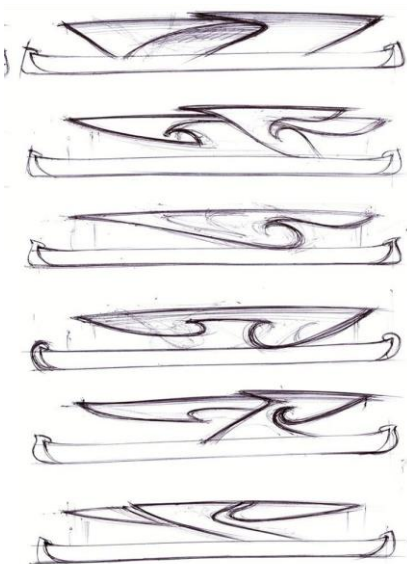
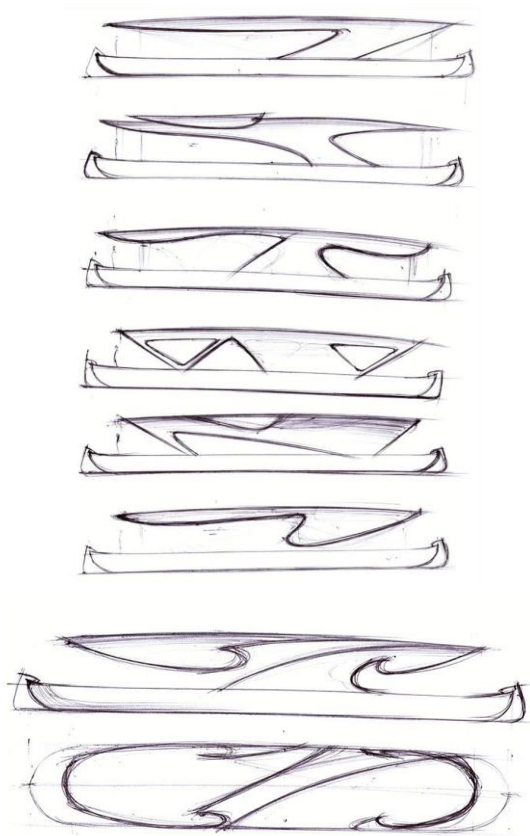


Form - Ideations



DIRECTION 3

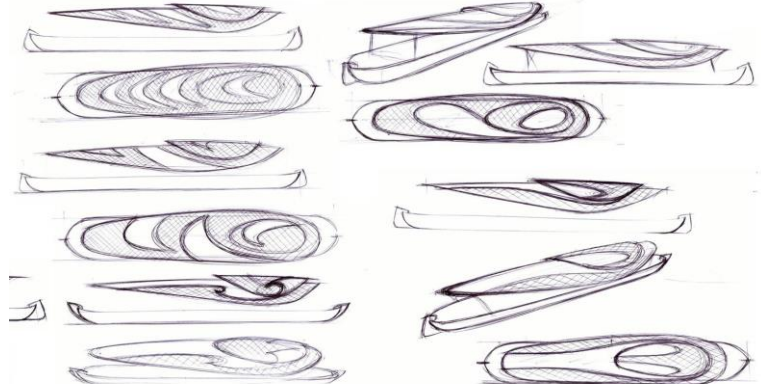
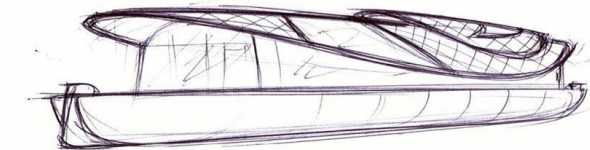
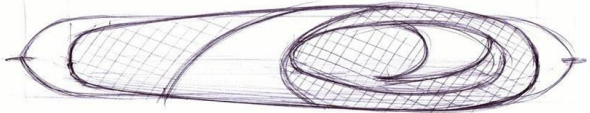
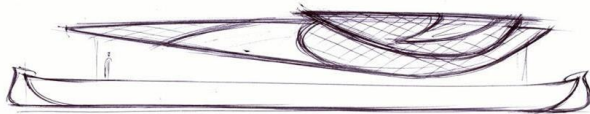
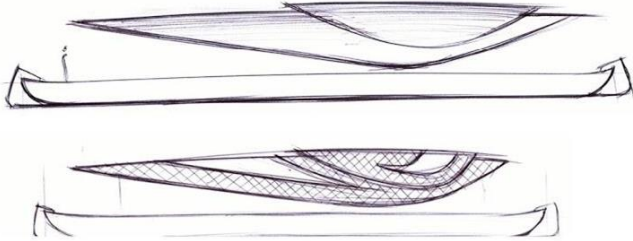
Form - Ideations



DIRECTION 4

Form - Sketch development

Direction 1

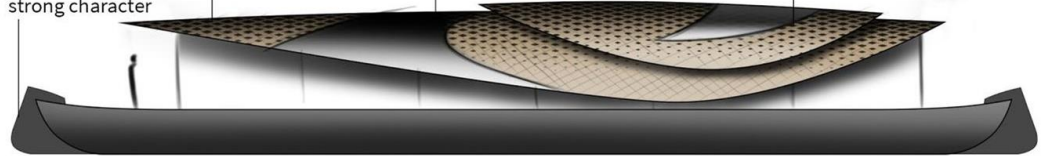


'Kombu' presents a very dominant and strong character

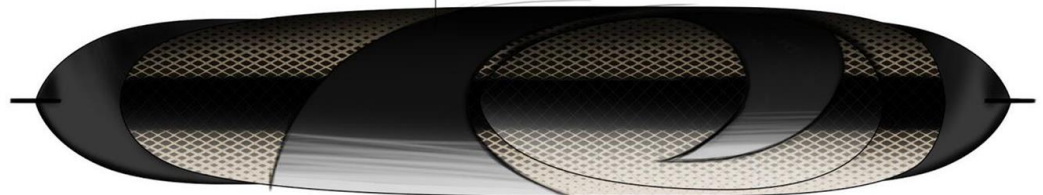
Solar panels emerging out of thatched roofing

DLO opens up above the bedroom area

Double roof adds a sense of royalty to the form

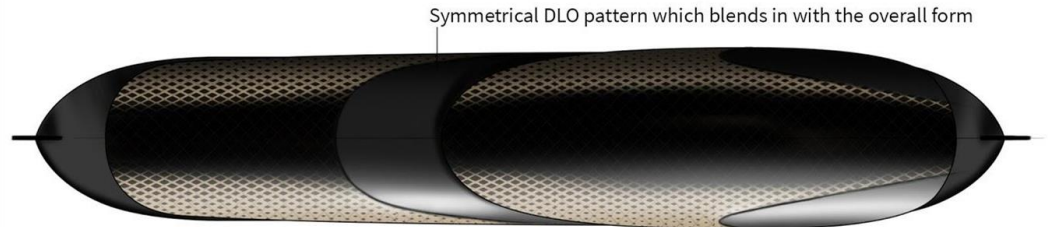
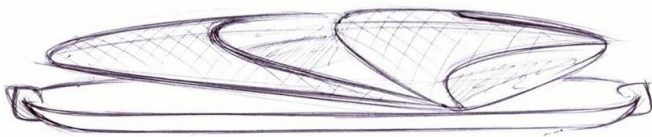
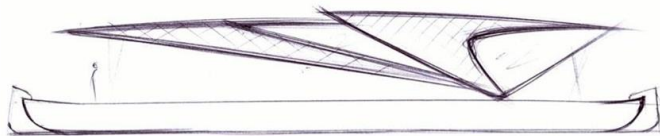
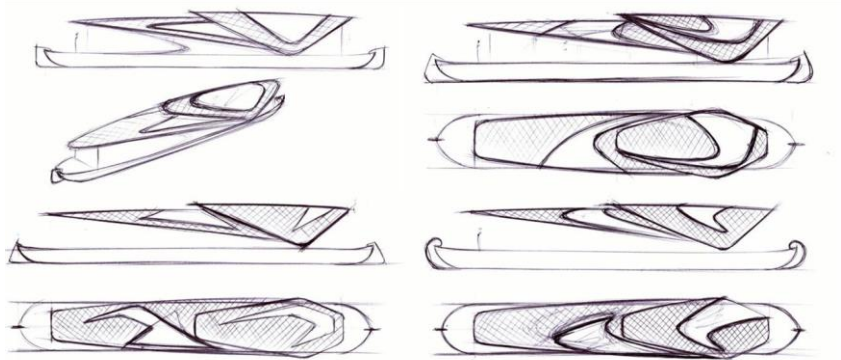
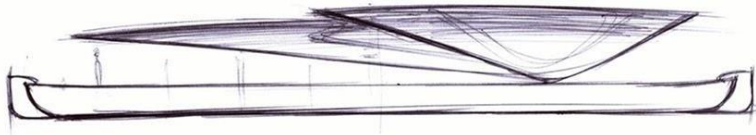


DLO forms a spiral on the canopy



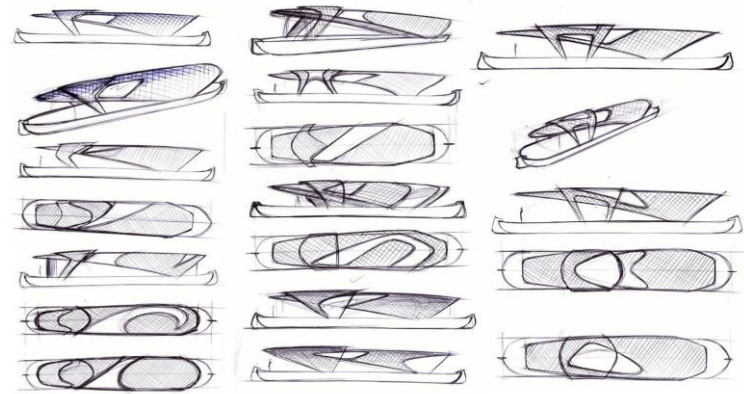
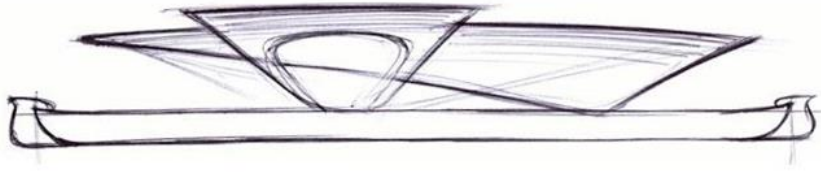
Form - Sketch development

Direction 2



Form - Sketch development

Direction 3

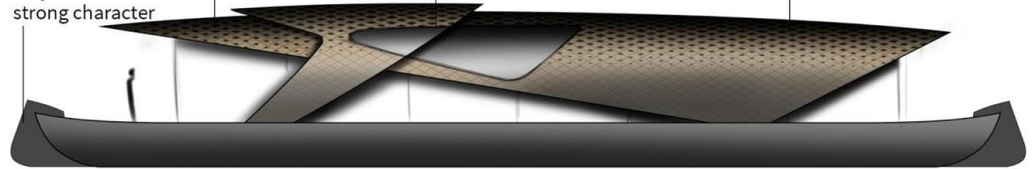


'Kombu' presents a very dominant and strong character

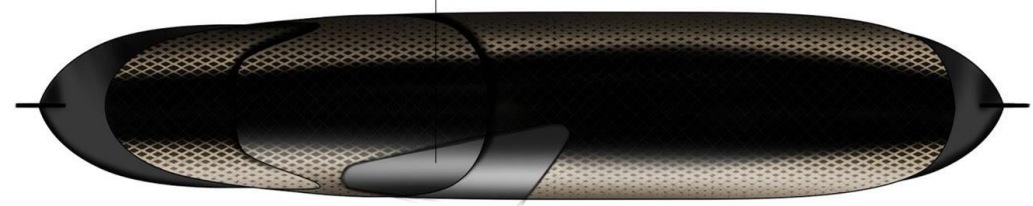
Solar panels emerging out of thatched roofing

DLO opens up above the bedroom area

Dominant roof presents a heavy visual image

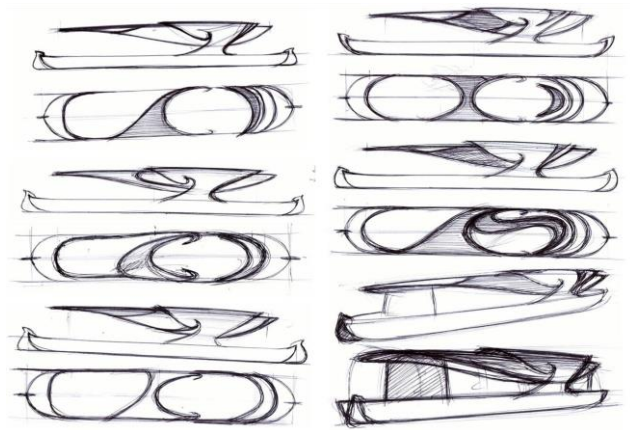
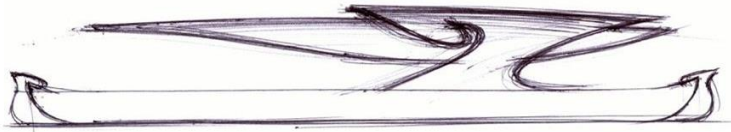


DLO element cuts through both roofs



Form - Sketch development

Direction 2

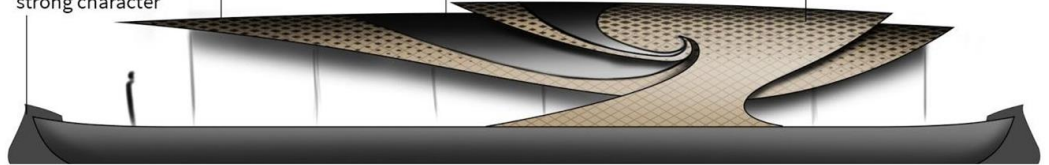


'Kombu' presents a very dominant and strong character

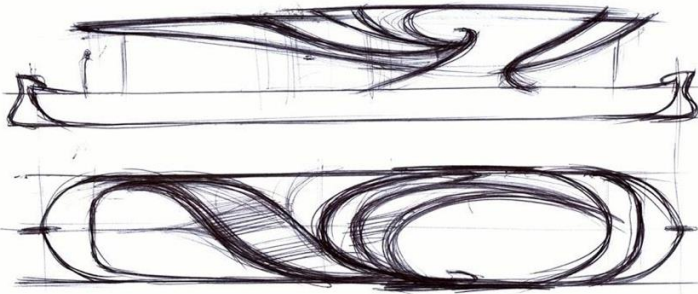
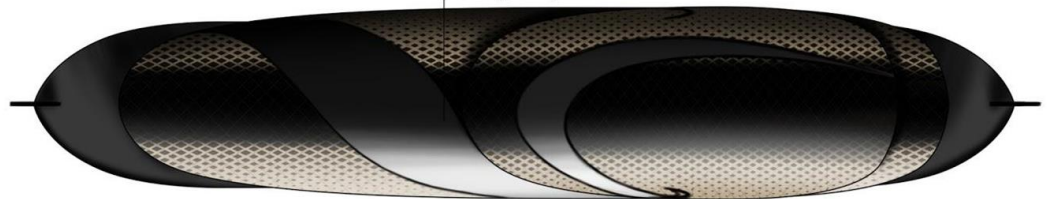
Solar panels emerging out of thatched roofing

DLO opens up above the bedroom area

Flowing lines inspired by traditional Kerala patterns

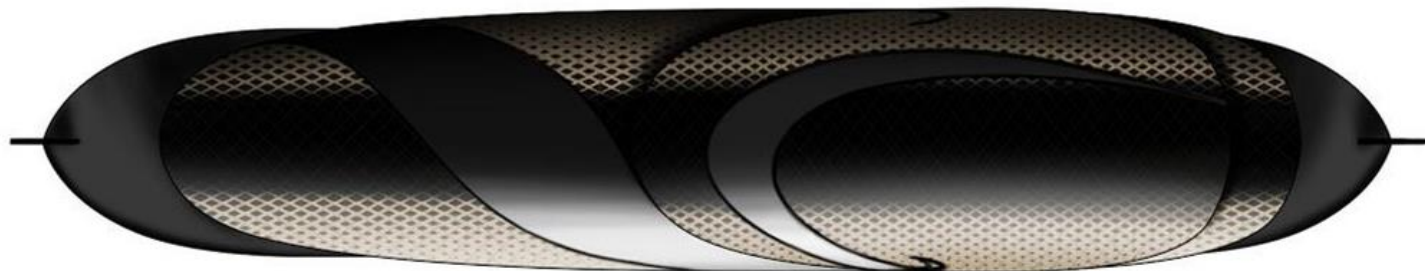
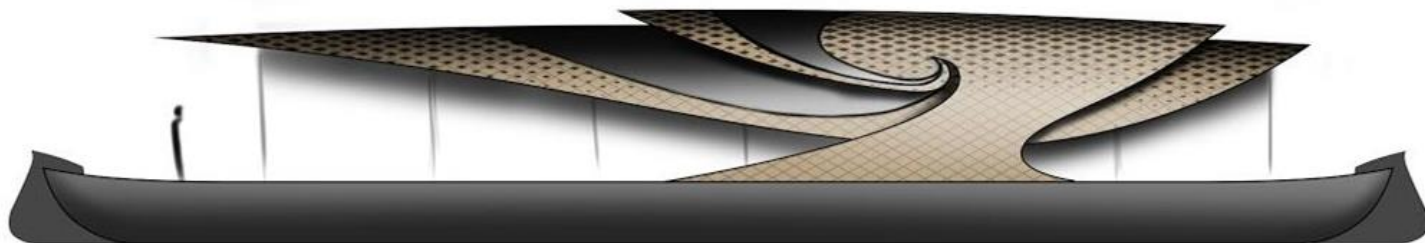
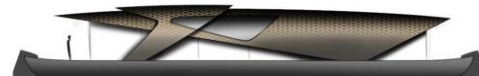
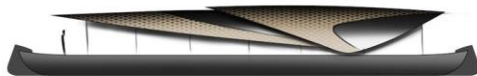
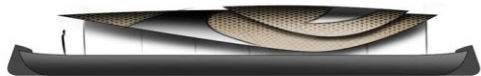


Flowing DLO pattern



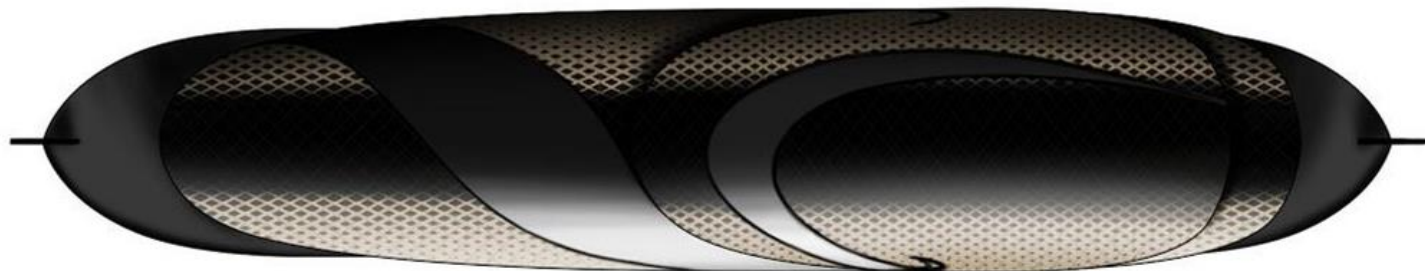
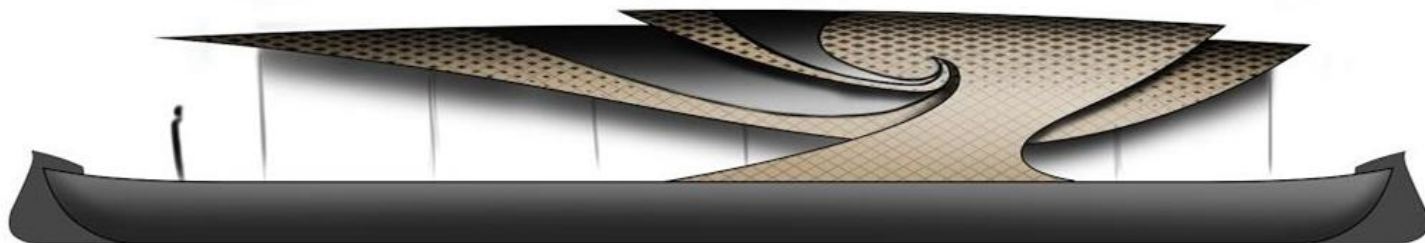
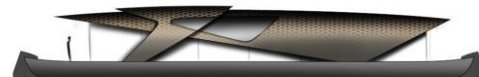
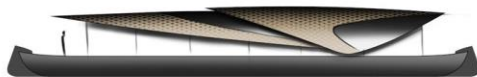
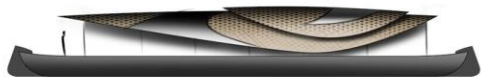
Form - Sketch development

Final direction



Form - Sketch development

Final direction





Context
Research
Design Brief
Package
Concepts
Design



Context
Research
Design Brief
Package
Concepts
Design

Design - Interiors



Design - Interiors



Pathway leading the user
through all the spaces

Low height seating

Design - Interiors



Deck space doubles as stage for cultural performances

Live weather and location info conveyed to user by boat AI via smartscreen

Dining space integrated into lounge



Design - Interiors

Live weather and location
info conveyed to user by
boat AI via smartscreen



Design - Interiors

DLO gives an exquisite open feeling to the entire bedspace

Live weather and location info conveyed to user by boat AI via smartscreen



Design - Interiors

Smartscreen doubles up as an entertainment screen

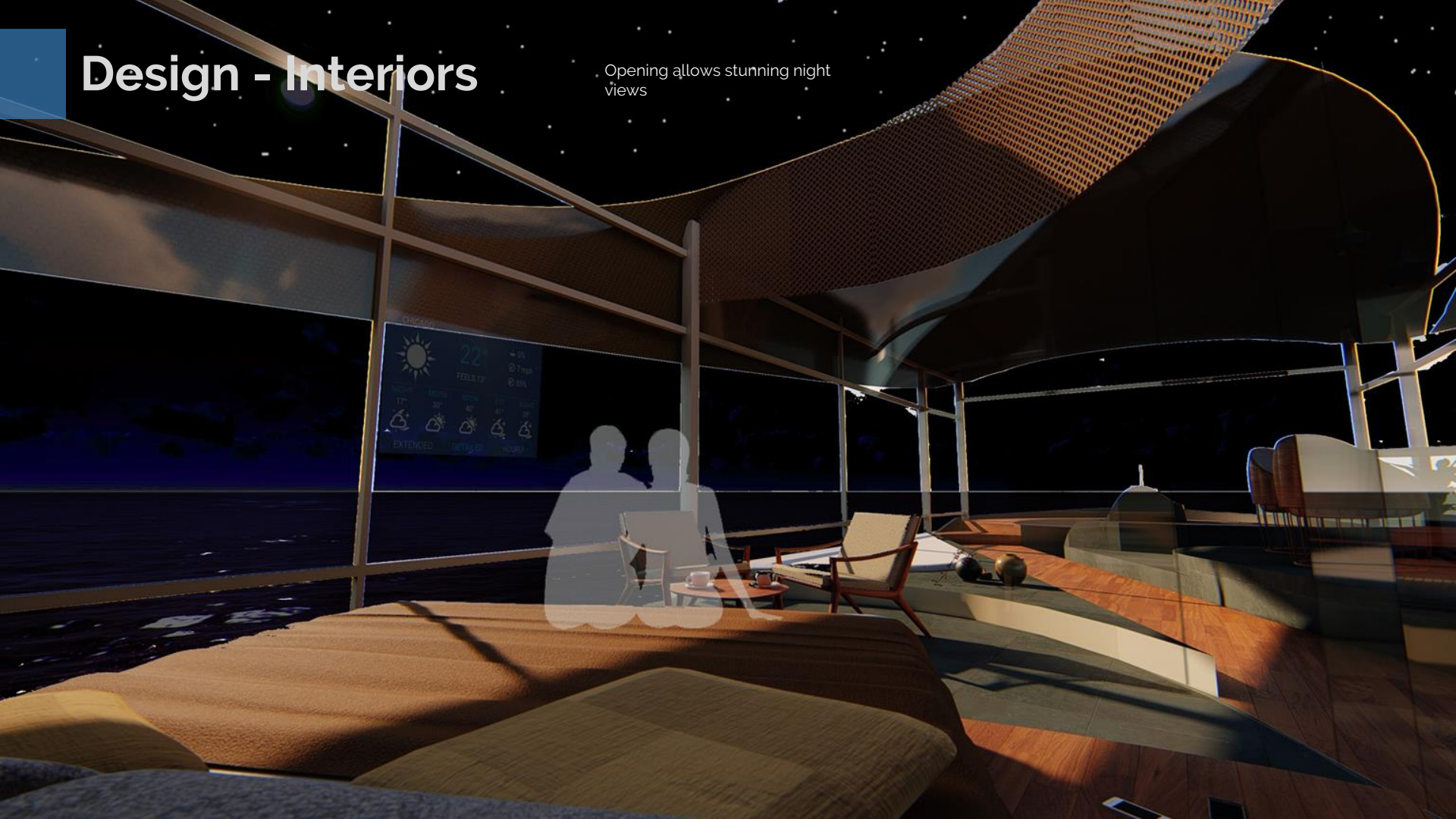
Live weather and location info conveyed to user by boat AI via smartscreen

Opacity of smartglass increased for giving privacy to user



Design - Interiors

Opening allows stunning night views



Design - Interiors

Flowing pathways lead the user to the rear spaces



Design - Interiors

Pathway opens up into the kitchen space with a high stool seating



Design - Interiors



There is a strong visual connect between the rear and front spaces

Design - Interiors

Rear space offers
an ayurvedic
massage area with
opened out views
to the backwaters



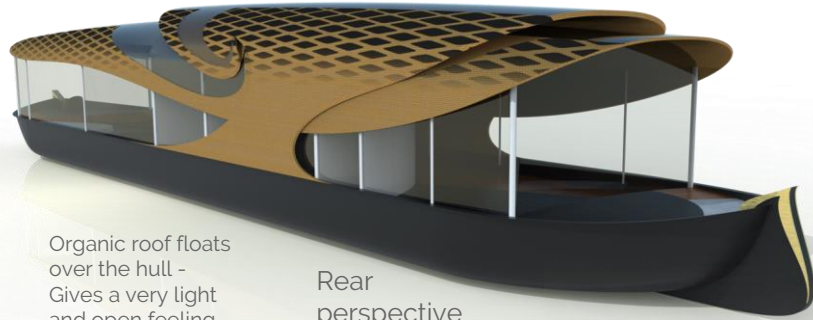
Design - Interiors

Open deck at the rear offers a completely barrier free viewing spot

Low height seating

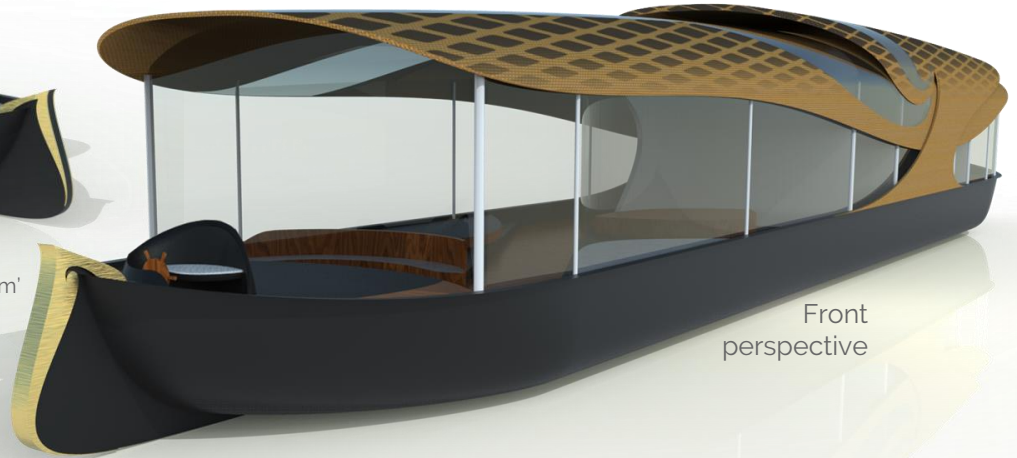


Design - Exterior



Organic roof floats over the hull - Gives a very light and open feeling

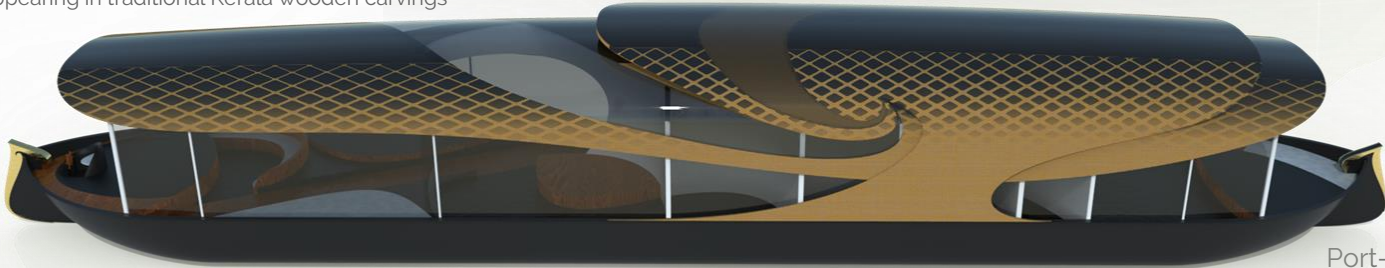
Rear perspective



Decorated 'Aniyam' gives a royal and festive feeling to the boat

Front perspective

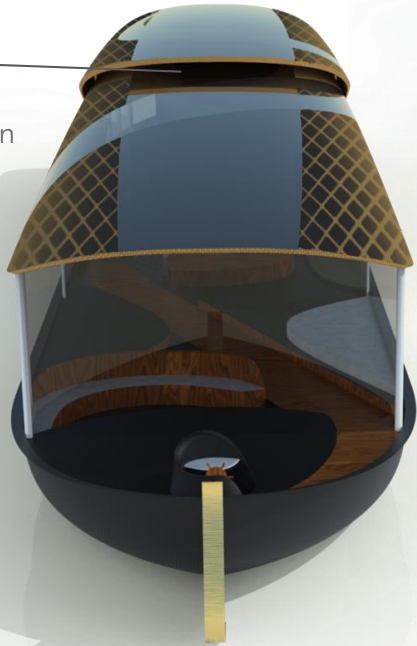
DLO carved into the roof by flowing curves reminiscent of patterns appearing in traditional Kerala wooden carvings



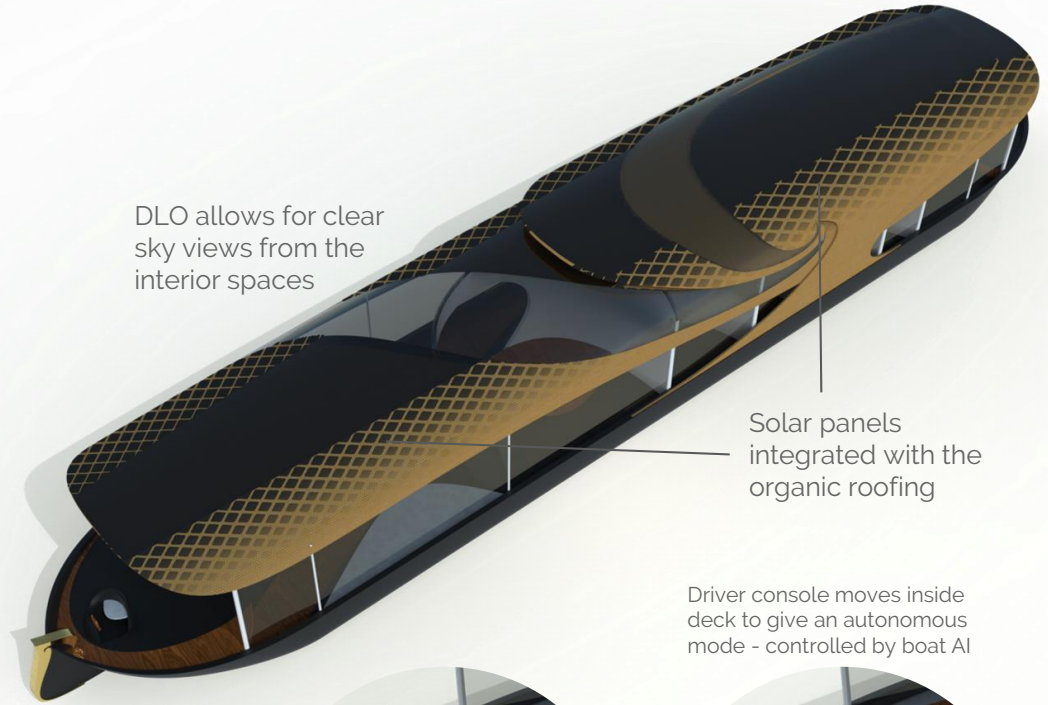
Port-side

Design - Exterior

Double roof allows for cold air to pass through the roofs creating a draft and helping in ventilation from toilets



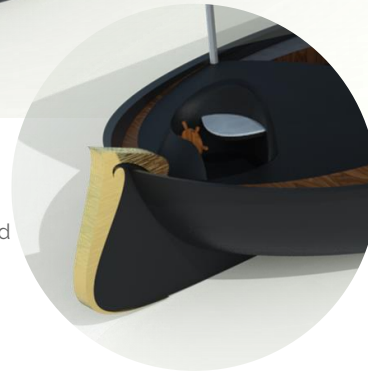
DLO allows for clear sky views from the interior spaces



Solar panels integrated with the organic roofing

Driver console moves inside deck to give an autonomous mode - controlled by boat AI

Front deck seats the driver cocooned in an organically shaped seating and console unit



Design - Exterior



Design - Exterior



Fin.