

INTERNSHIP REPORT

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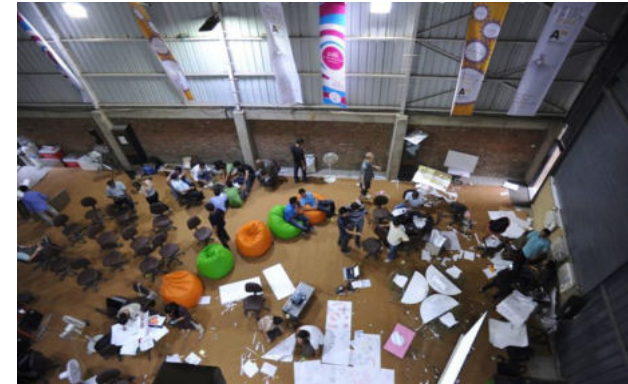
Acknowledgement

Firstly, I would like to thank the Faculty of Mobility & Vehicle design at IDC who encouraged me to take up this internship. Further I would like to thank Design Factory and the team I interned with, for providing me an opportunity to work on an industrial design project.

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Introduction

The Summer Internship was for duration of 40 days, from 13th May 2013 to 21th June 2013. Essentially, the idea of the internship was to gain experience by getting involved with an Industry/Firm/NGO and get exposed to their design work and processes. Further the objective of this project is to be part of the process where design is being implemented, contribute towards the process and learn from the situation based on my chosen area of interest.



About Design Factory India

Design Factory India is inspired from Aalto Design factory, Finland and offers an interdisciplinary platform that unites the professional and the academic world promotes collaborations and produces effective outputs that provide strong design, business and engineering solutions. To achieve this, it unites people from different backgrounds and creates teams comprising of students, mentors and managers to work on a design project. The duration of each project may vary depending on the industry requirements and scope of work. At the end of the project, teams are to deliver evolved, unique, innovative but practical solutions.

The Design Team



The Project

The term 'luxury' has different connotations for different people. The aim of the project is to create a universal luxury statement for JCBL group by designing an intercity long distance luxury bus for the Indian market.



From being incorporated in 1989 as a company that would manufacture high quality buses and load carriers for Indian automobile industry like Swaraj Mazda, Eicher and Tata Motors, JCBL has today evolved into a highly successful bus coach manufacturing company.

JCBL produces high quality luxury bus coaches, coach vehicles, mobile home, special application vehicles, school buses, and ambulances for OEMs like Ashok Leyland, Eicher, Tata, Mercedes, Scania, Volvo and Swaraj Mazda.

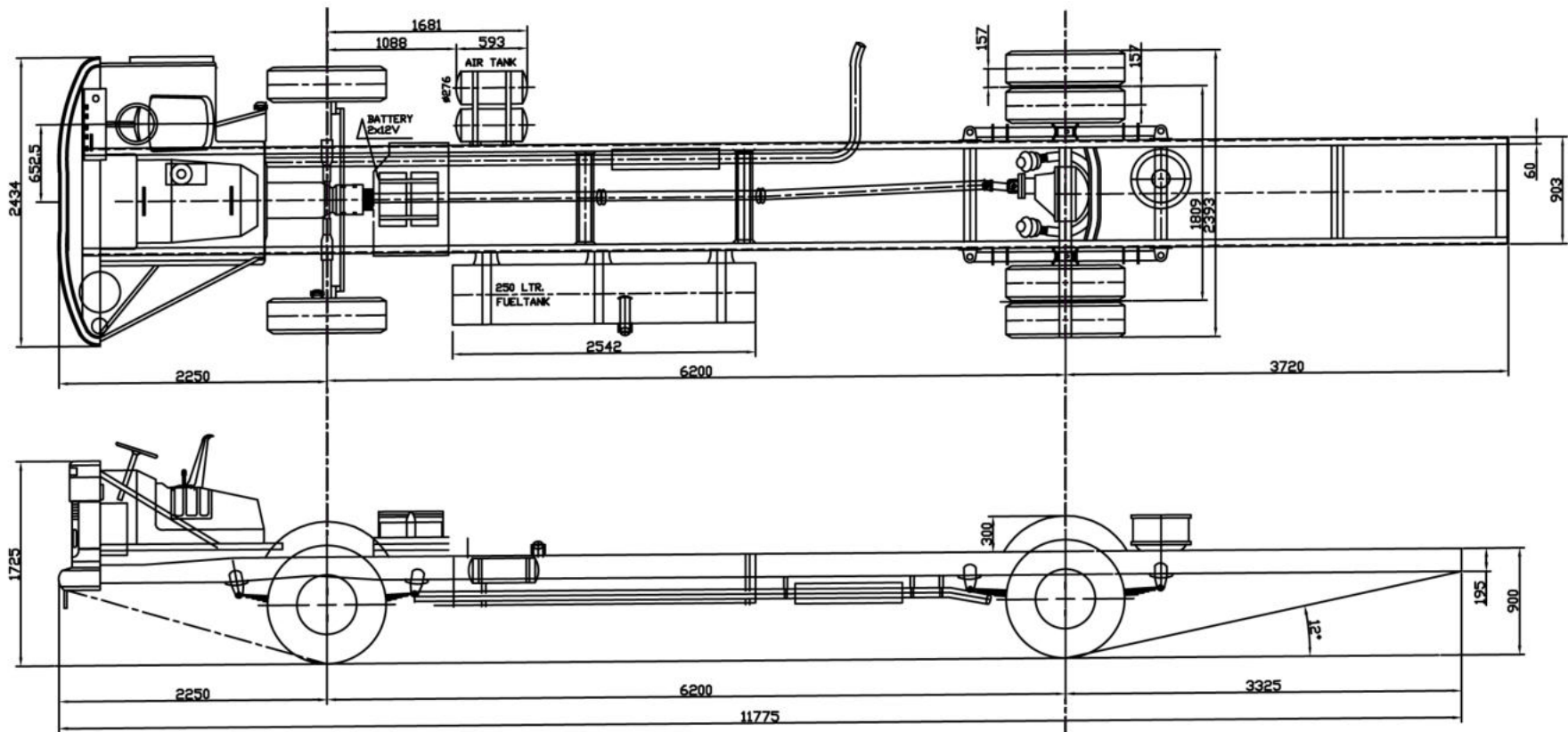
Through this project, JCBL aims to launch luxury buses under its name and build a brand of its own. The chassis along with the engine and transmission will be bought from Tata and Ashok Leyland and JCBL will build the body structure, exterior and the interiors and aims to sell it under its brand. So this project involves creating a new brand identity for JCBL through design.

Project Brief

I joined the project at a stage when the design directions for the bus exterior styling was fixed. The status of the project and the work done till now was briefed to me which is explained in this section.

Objective

- To design a high-end luxury inter state bus for JCBL Stand out as a superior product
- Should conform to the engineering constraints for ease of manufacturing
- The bus should be a semi-sleeper, luxury segment
- Design should work with different chassis and should have scope for cost effective customization
- Should conform to the regulations of AIS 052



Chassis layout of TATA 6200

The design is done for a TATA chassis (shown above) and later the design has to adapted for a variety of chassis of Ashok Leyland and Eicher

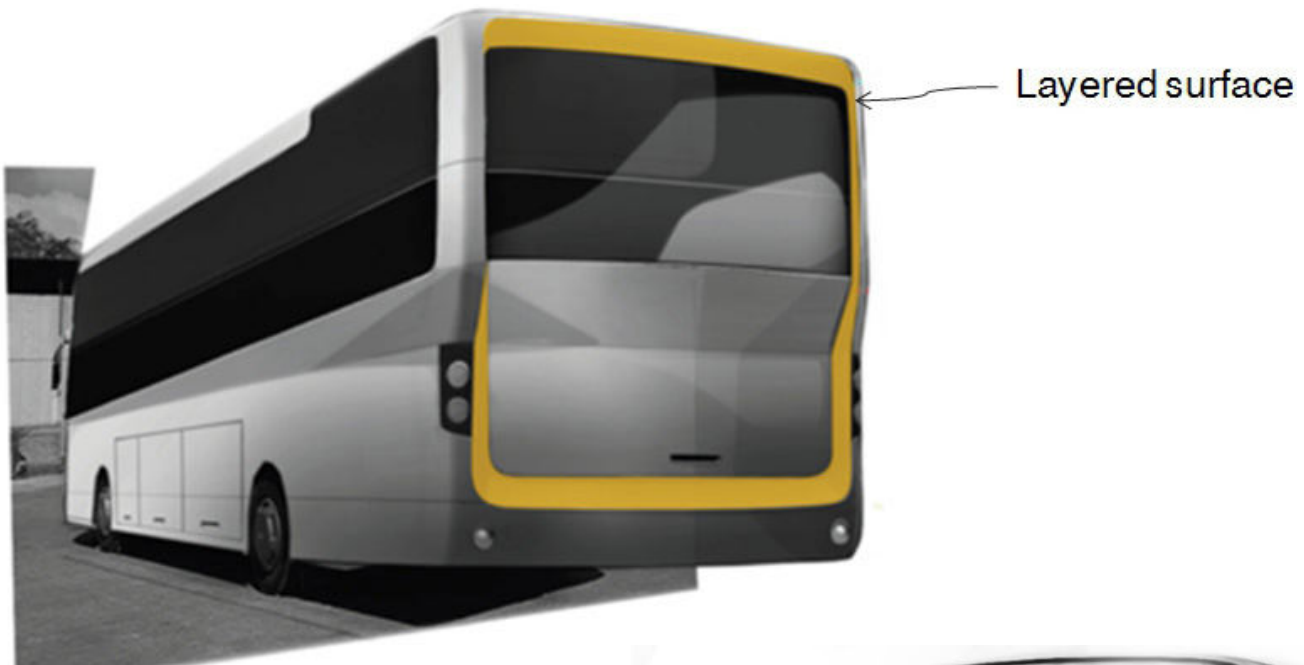
Key words for design were already chosen based on JCBL's identity and aspiration. As per the research, it was concluded that the design should reflect the following keywords

- Jazzy
- Subtle and elegant
- Futuristic

Based on these keywords, concept ideation and preliminary sketches were done. From these concepts certain design elements were chosen and the design directions were frozen.

The exterior concept as shown is picked up and the following design directions are chosen

- use of layered surfaces and breakaway from the flat front
- need for jazziness in the design
- should break the boxy feel of the bus
- should also be elegant which signifies luxury



Need for more
interesting front
fascia

Change the grille
area



Design Direction

Based on the keywords and design directions chosen from primary and secondary research and from preliminary concepts, it is chosen that the exterior design of the bus should reflect the following keywords

Jazzy

Bright, colorful, lively and showy (as per Meriam Webster Dictionary)

Elegant

Pleasingly graceful and stylish in appearance or manner

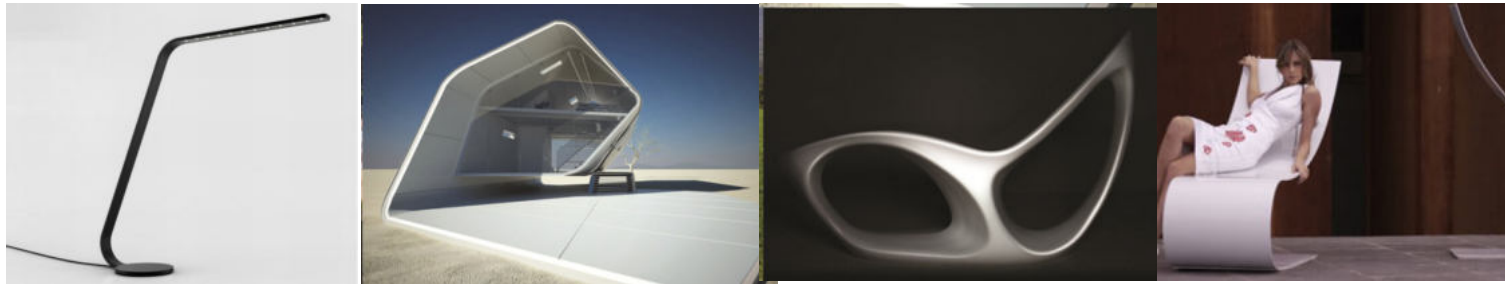
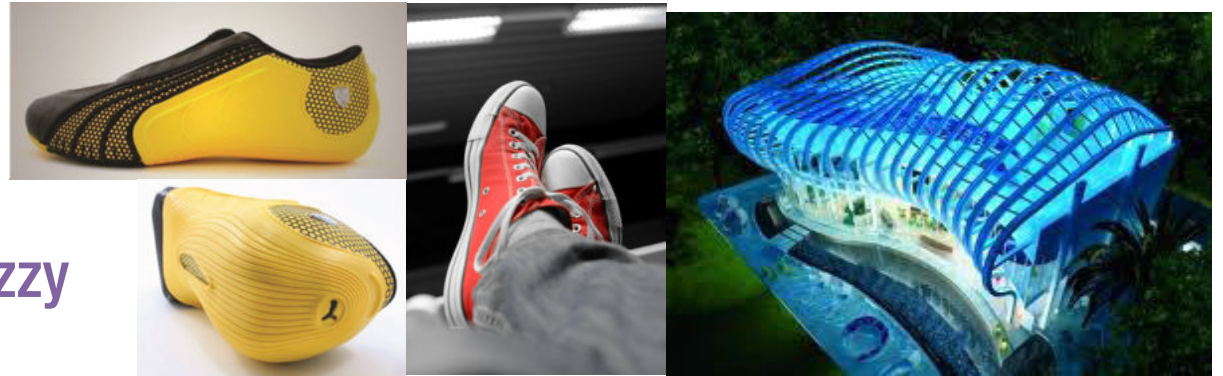
Futuristic

Having or involving modern technology or design

Of technology, a concept, etc, advanced so far beyond that which is current as to appear to be from the future

Mood Board

Jazzy



Subtle & elegant

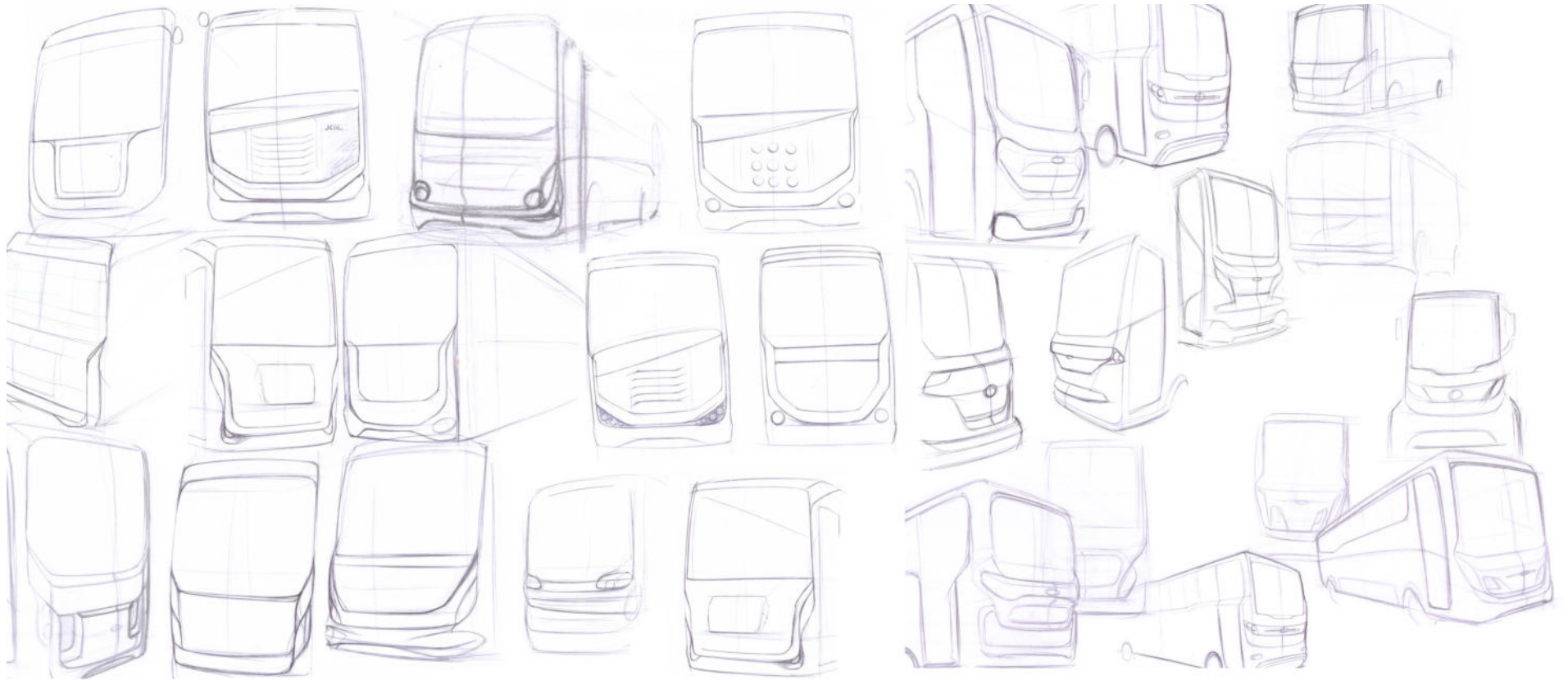


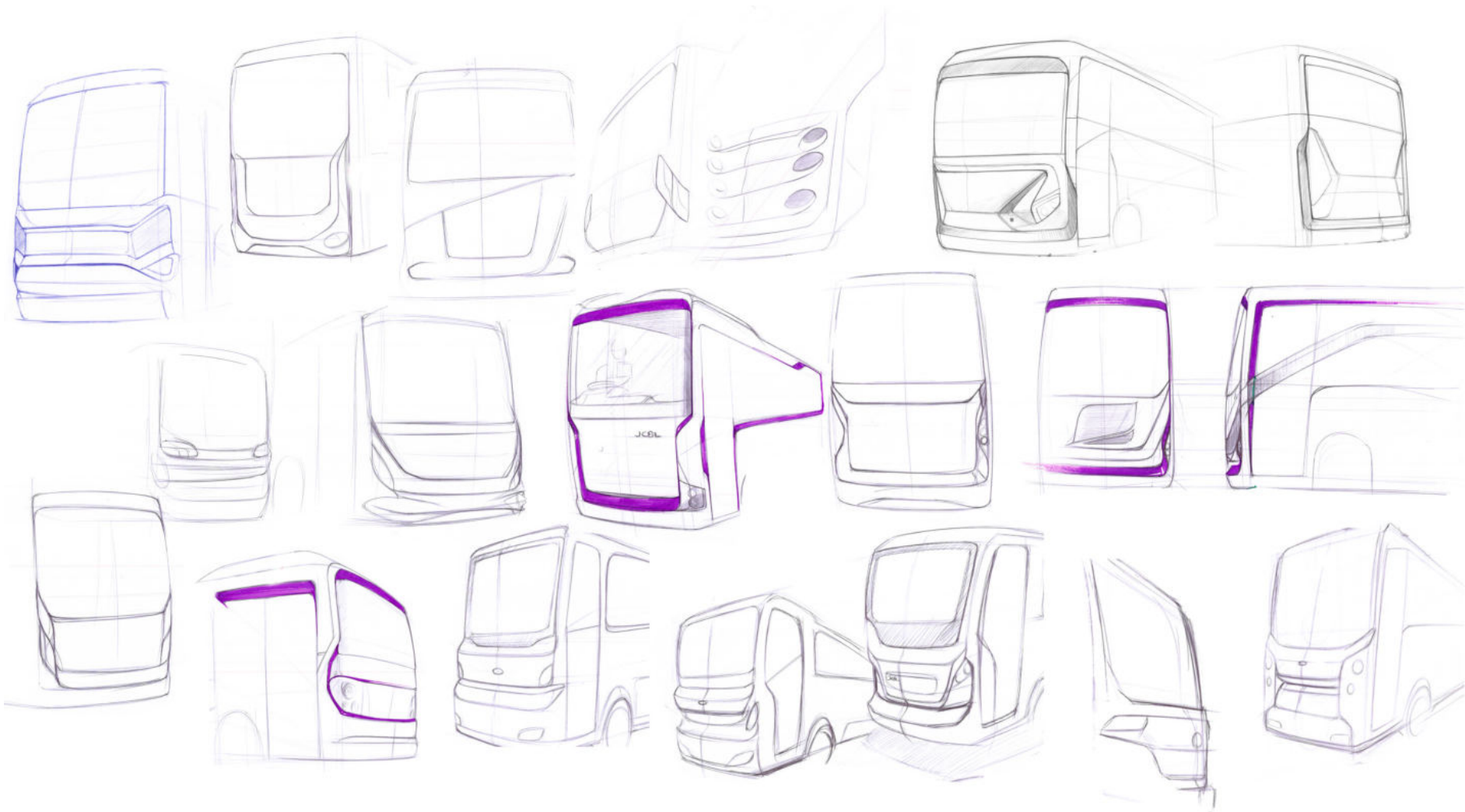
Futuristic

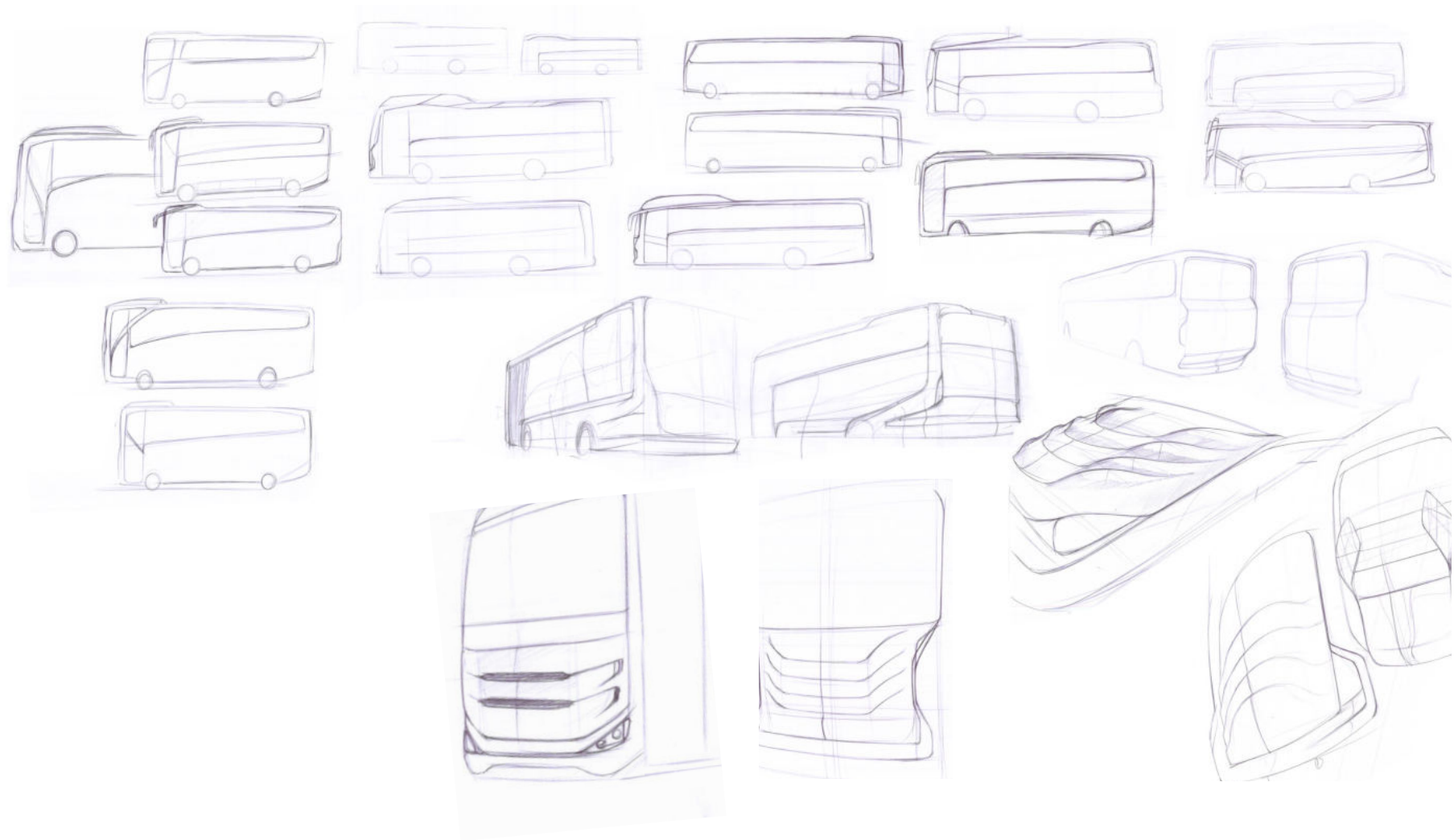
Concept Exploration



Front Facia Exploration







Final Concepts



Concept 1

(by Chirayu shinde)

Subtle and playful curves in the front
Front headlamps with integrated headlamps





Concept 2
(by Chirayu shinde)



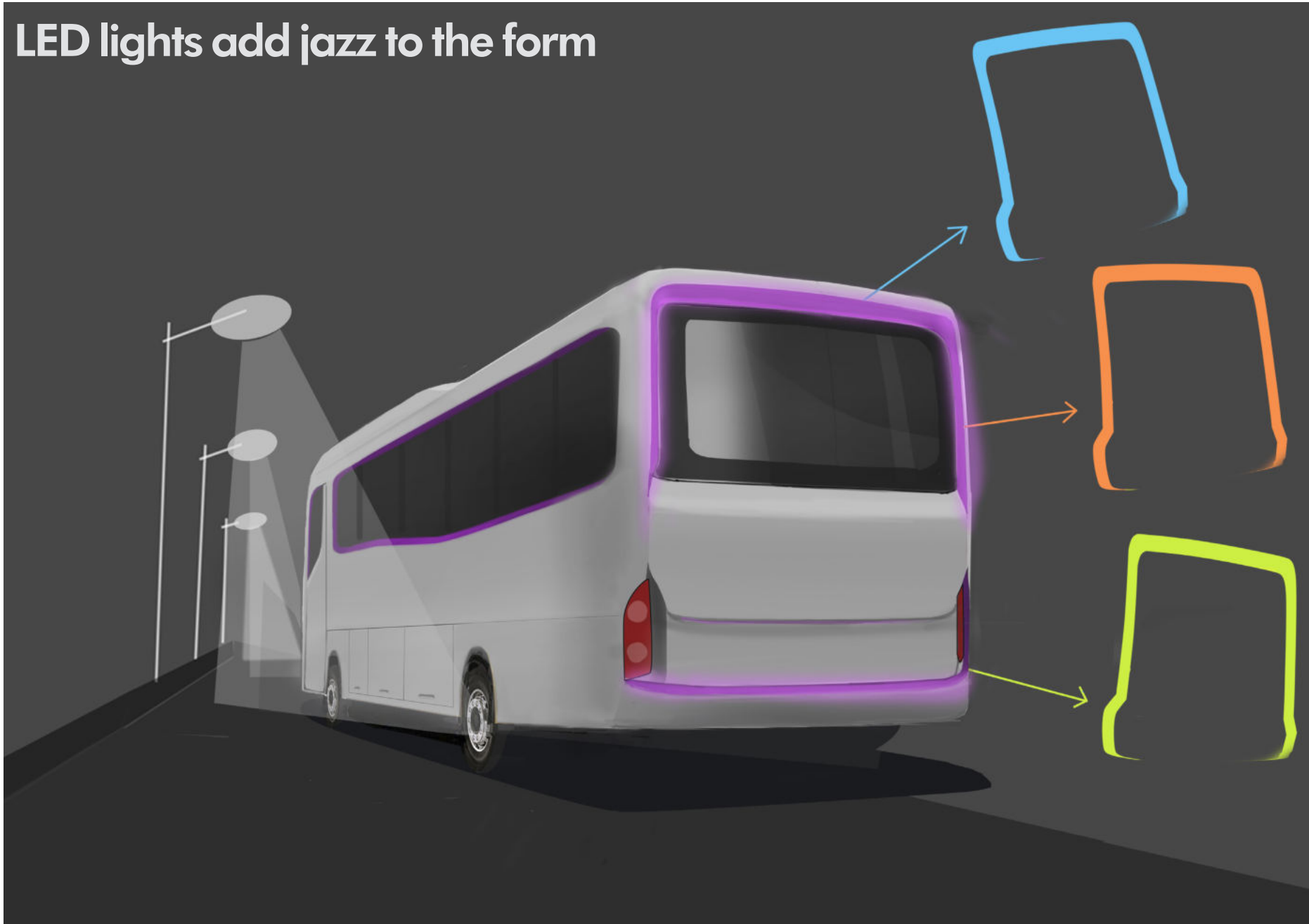
Concept 3

(by Me)





LED lights add jazz to the form



Different Front grille options for concept 3 was explored



Final Design

The final design was chosen by brainstorming on the exterior concepts and which concept goes with the keywords of Jazzy, elegant and futuristic. It is important to note that though the design should be flashy, it should convey the jazziness in a subtle way (as the design should be elegant also to convey luxury). Hence the designs were rated on these three factors and also the way it is carried out in all the 3 views (front, rear and side).

Further the concepts were shown to JCBL group and reviewed. Concept 2 did not go well with the client and hence it was not chosen.

Concept 1 is perceived to go well with the design theme but found to have some issues like the front grille area is found to be aggressive and plain. As per the client, the front grille area should give more dynamic feel in concept 1 which is solved by the surface treatment in concept 3. Hence some of the elements of concept 3 were to be carried out and a modified final concept with the features of concept 1 & 3 is tried out.

Also the side panels are found to be less dynamic and requires more subtle but dynamic curves. Since any surface changes in the side panels is not possible due to manufacturing constraints of the stretch panel, change in the side window lines were tried out.

As for the rear, concept 1 rear was found to be good and goes well with the theme of 'jazzy' and also 'elegant'.



the idea of having AC unit in the front and integrating the rear view mirror with it adds dynamism in the side

Better treatment of Grille surface

Headlamp not looking integrated with the layered blue surface



Grille area is aggressive and still flat

Design cues from both concept 1 and 3 were picked and explored to arrive at the final design as shown.



The side view is made more interesting by the change in the curves along the length. Also by keeping the AC unit in the front, the boxy feel in the side view has been done away with. Further the rear view mirror design are integrated with the AC unit.



Final Rear Design



Benchmark Study for Interiors

Interior passenger seating capacity - 45

The interior of the bus has more comm parts which is premade and procured from different supplier groups. Hence the scope for design is limited to the color of the trims and the lighting. As the seats used in the bus are commonised and already available in the market, it cannot be changed. Further the hat racks which are used to keep the passenger backpacks are also to be bought from supplier. Hence it is more important to study different hat rack designs and find a pre-made hat rack design supplied by a company.

Further the side body trims and the flooring has to be decided. The lighting inside the cabin has to be designed and should go with the interior theme of minimalism, Spacious and futuristic.

As a part of this, I was asked to check out and study the interiors of the Indo-Canadian Transport bus (multi -axle Mercedes Benz) which was customised by DC design.



A typical horizontal hat rack in normal buses



Vertical hat rack

Study of Indo – Canadian Bus for vertical hat rack



- The bus has a passenger capacity of only 24.
- The use of beige and dark brown dual interior tone gives a luxury feel
- The hat racks are vertically placed as compared to a typical horizontal hat rack but occupies more spaces comparatively
- Cannot use the hat rack system as the passenger capacity in our bus is high

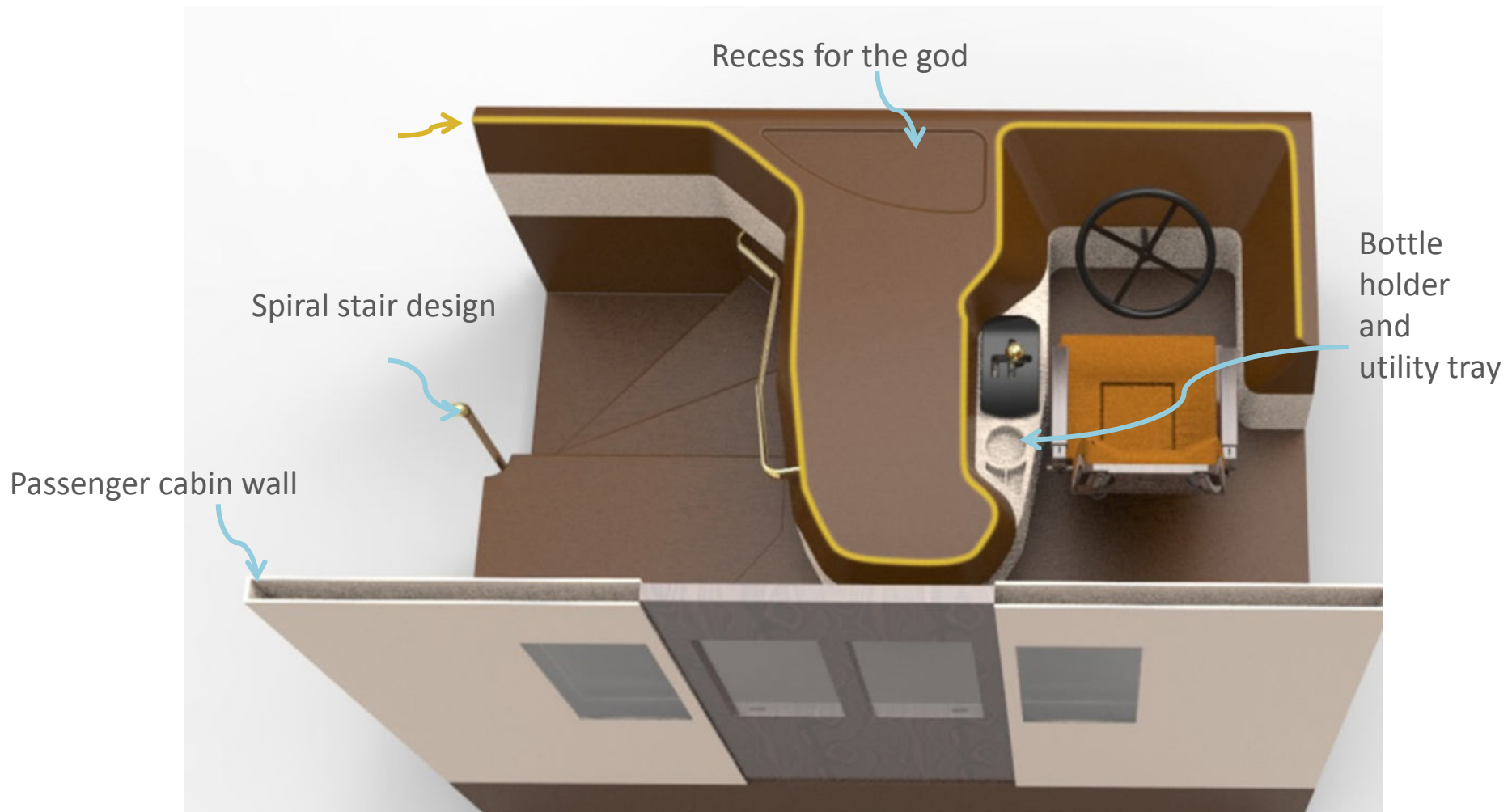


Interiors Ideation

Brainstorming was done to generate interior themes and ideas were generated for interior mood . Use of mood lighting, horizontal hat racks, dual tone interiors were suggested. The interior theme is yet to be freezed.



Some of the features of the driver dashboard area were also discussed for a clutter free design.



Learnings

- I learned how to work in a team and for a client
- The process of design from idea generation to concept development
- How design gets influenced by Regulations, Manufacturing constraints and client's feedbacks
- Evaluating various concepts to choose the final design
- An alias model of the exterior is being made as per the render and the chassis layout.
- Interior theme exploration for a bus

References

Automotive Industry Standards 052 : Code of Practice for Bus Body Design & App
www.designfactoryindia.org
www.JCBL.com