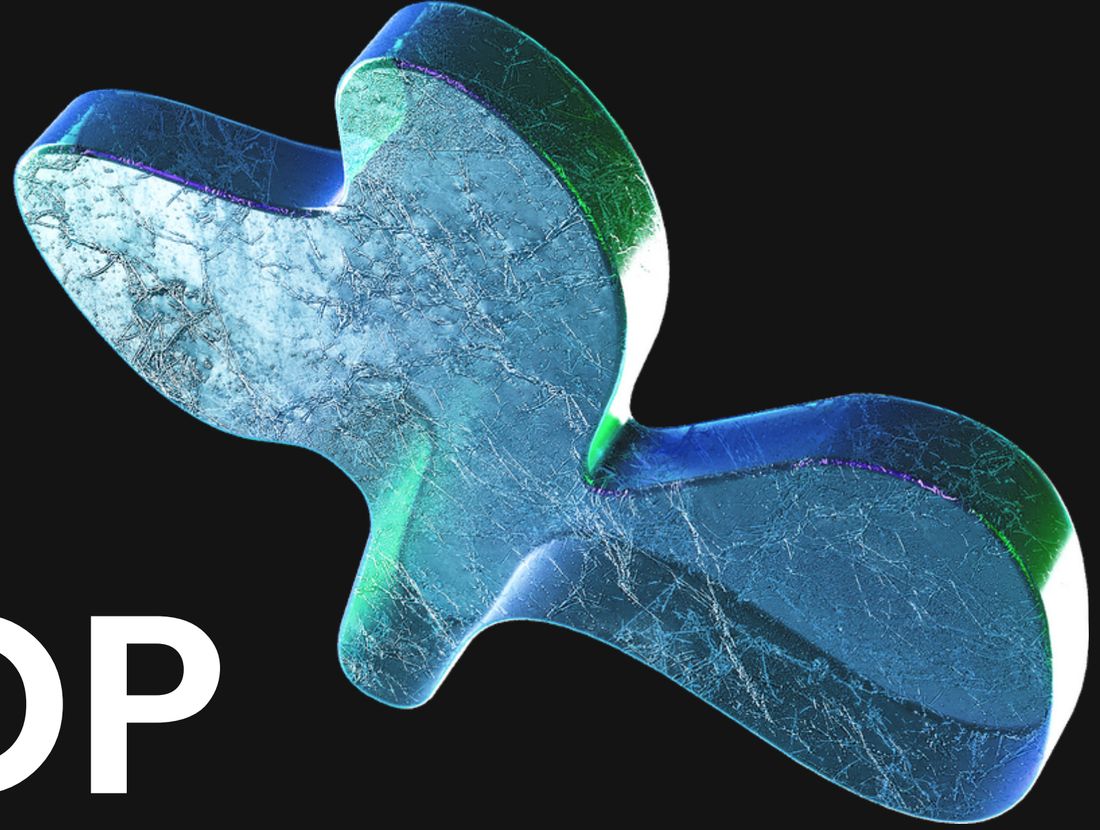
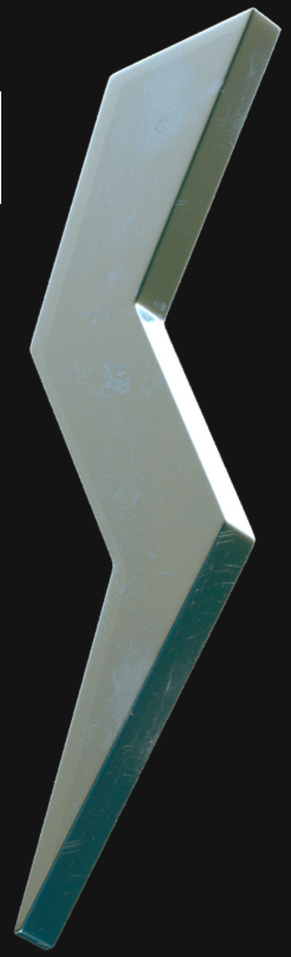
VIRGIN HYPERLOOP



TEAM : LEVITATION

LEVITATION MEMBERS



ABHISHEK YADAV

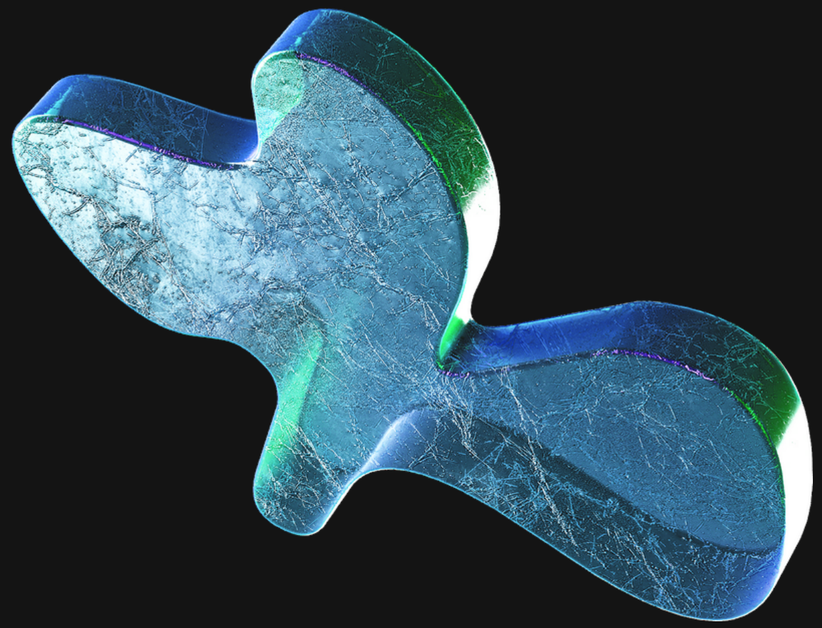
SUBHA BAL PAL

SHUBHANSHU TIWARI

HYPERLOOP

Hyperloop is a new mode of transportation designed to eliminate the barriers of distance and time for both people and freight. It can travel at speeds approaching 1,000 kmph, connecting cities like metro stops with zero direct emissions. Hyperloop technology is being considered in India, with a potential route connecting Mumbai to Pune in under 30 minutes

PROBLEM STATEMENTS

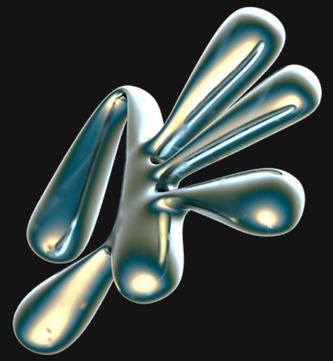


Create a tool or process to manage passenger flow in a hyperloop portal while maintaining targets for level of service and passenger experience

How would you manage an off-nominal scenario and maintain passenger flow when 2 pod bays are out of service at one time?

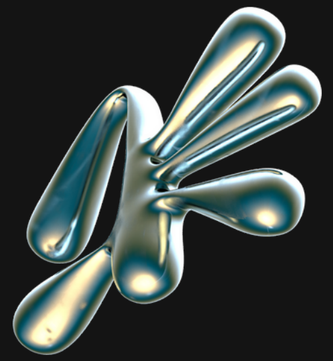
How would you manage passenger traffic into and out of the portal via different modes of transport? (i.e. pedestrian, private vehicles, taxis, metro, and high-speed rail).

Pods & Pod bays management



- The program assigns pod to a particular pod bay and passengers to their specific bays.
- Program checks for the arrival of the pod and their working status.
- When the pod is available then they are assigned to their designated bay.
- If the pod is damaged then the next pod is assigned to the bay designated to the previous(damaged) pod and the interval time between the two pods and two convoys is reduced by half to manage the passenger overflow.
- the pod running in reduced time is continued until nominal passenger number is reached.
- If the Bay for the designated pod is damaged then the pod is assigned to a bay in the same platform which is going to be used in approx. next 20-30 minutes so that both distance and crowd should be managed.

Passenger management



- After entering the concourse, the passengers can book a ticket for their journey from the available panels.
- Then the passenger is allotted to the bay according to the time of entering details.
- If the specific pod designated to the bay is found to be damaged then the program assigns the overflown passengers to the free seats available in the previous pod and this assignment is used until nominal passenger number is reached.
- If the pod bay is found to be damaged then its respective passengers are assigned to a bay which has least passengers and is of least distance.

SYSTEM ARCHITECTURE

A window for passenger to enter their details

Output and the ticket shown to the passenger

SERVER

Using customer data, saves log file with time.

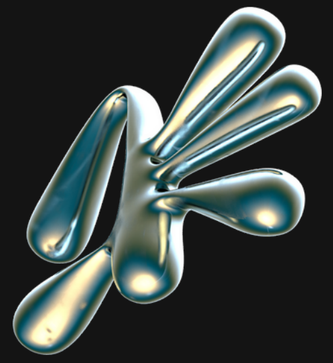
Log.txt

Using data, platforms are alloted

Date and time is automatically recorded

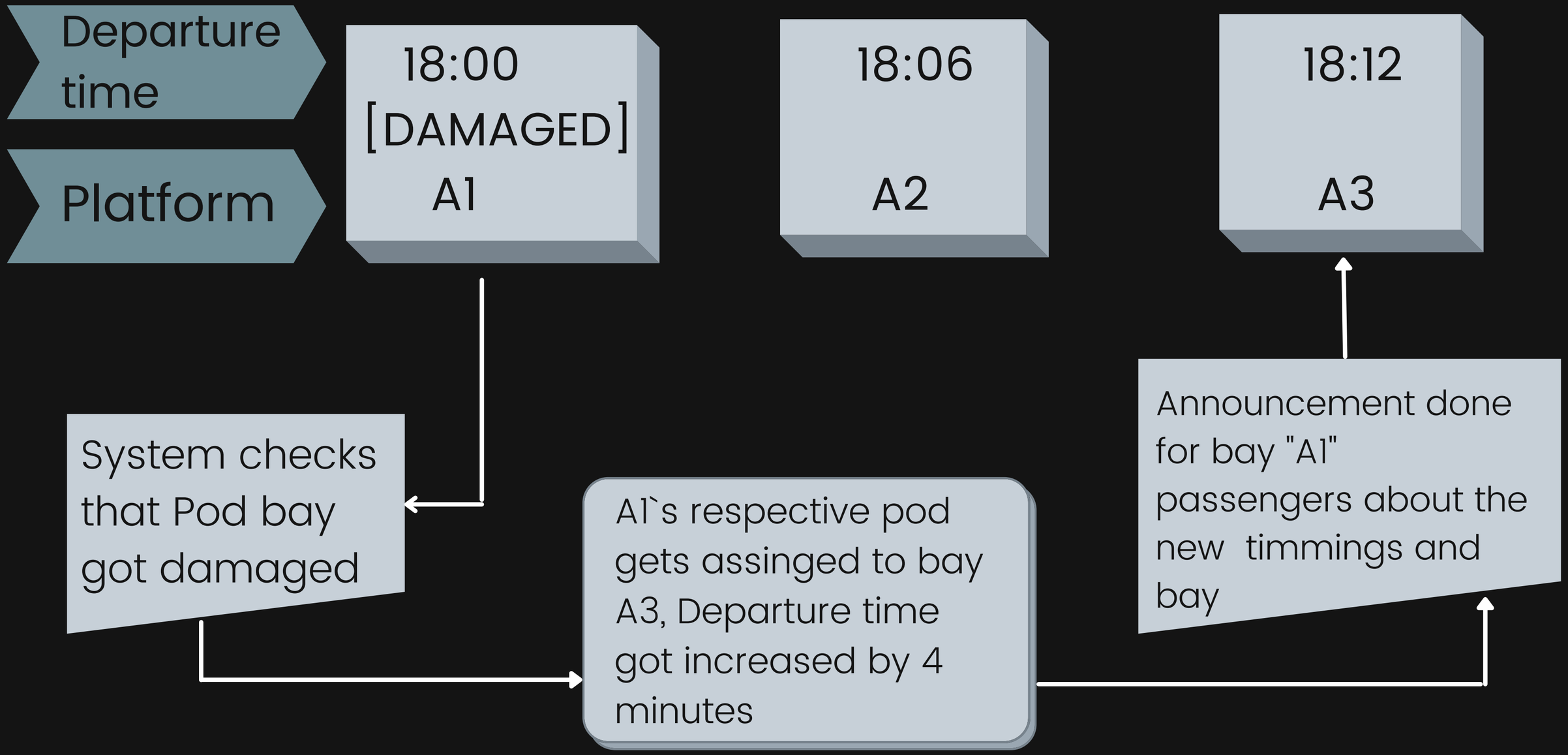
Program assigns pod to the passenger

Program Explained

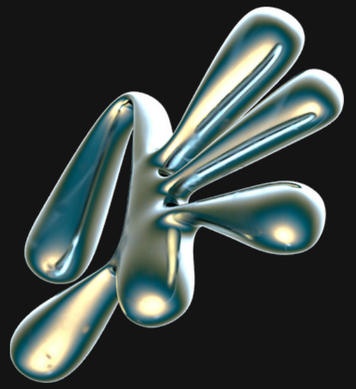


- After entering the concourse, the person can choose their work of traveling or receiving from available panels
- The receiving person submit basic details and is allotted a waiting access zone area
- Data of receiver with current time is stored in a text file.
- The traveller person submits their details like name, age, mobile number and destination.
- Each bay at every platform has their specified time in span of approximately 6 minutes.
- The program checks and assigns the bay to the passenger which is scheduled just after the time at which passenger entered the details.
- In the assigned bay the program checks the vacant seat and asks the passenger to choose any of them.
- All the details of passenger are stored in a text file which is fully secured.

POD bay Damage representation



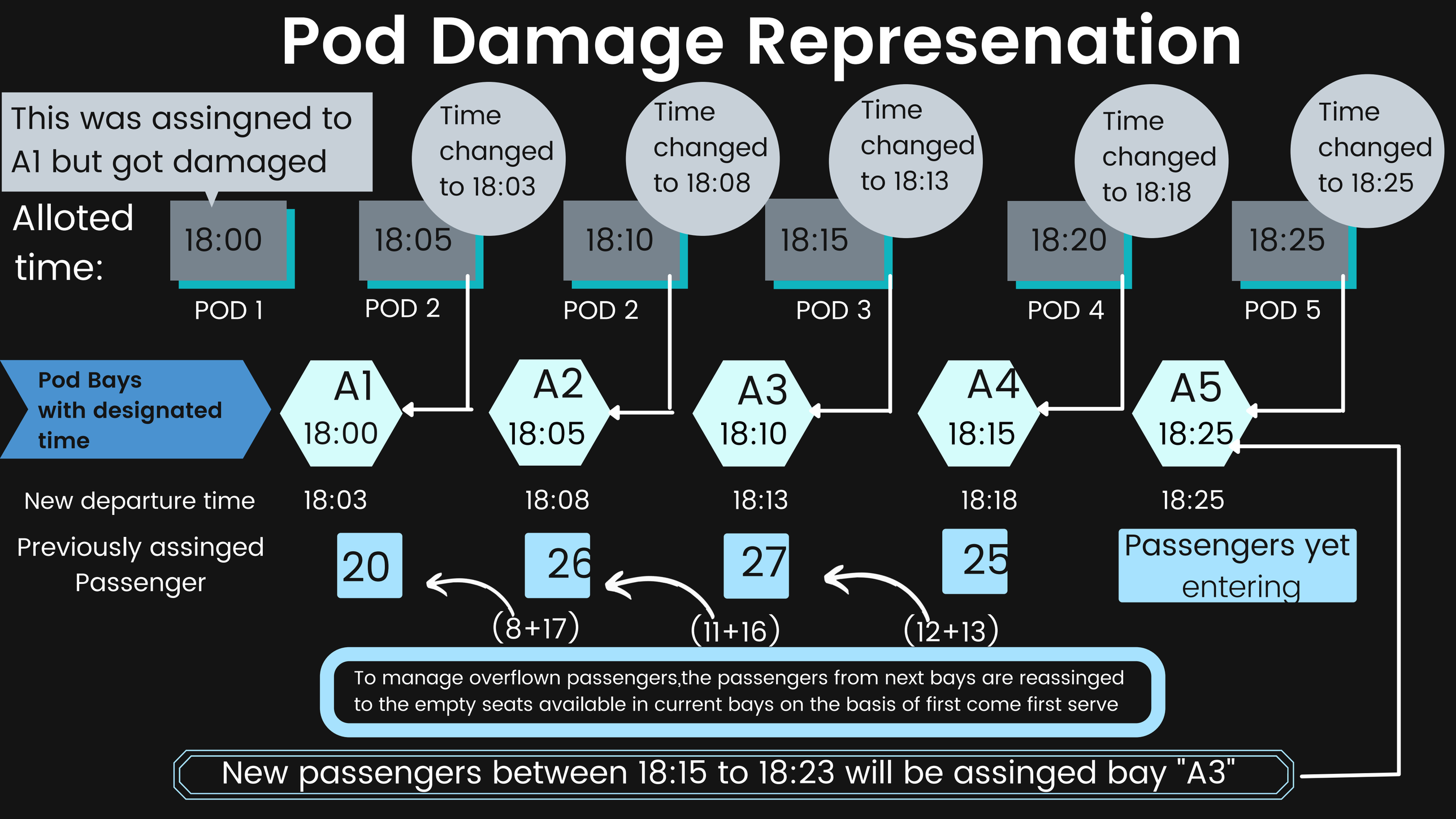
Explanation



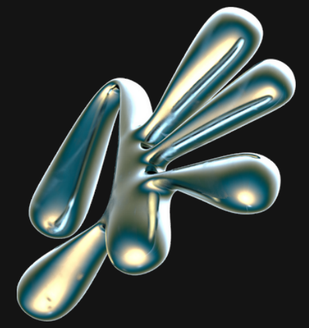
POD BAY DAMAGE

- A pod bay checking is there to check the maintanence of bays and send real time performance to the engineer montioring the pod bays.
- A pod bay "A1" at the platform "A" is designated at 18:00 departure and pod bay A3 is designated at 18:12 departure
- If bay "A1" got damaged then its respective pod would be send to bay "A3" with next departure time 18:04 set by backend code.
- Departure time for "A1" is 18:04, passenger should be informed through an announcement
- This will ensure that waiting time is minimum and passengers also have to cover minimum distance to reach their new assinged bay.

Pod Damage Represenation

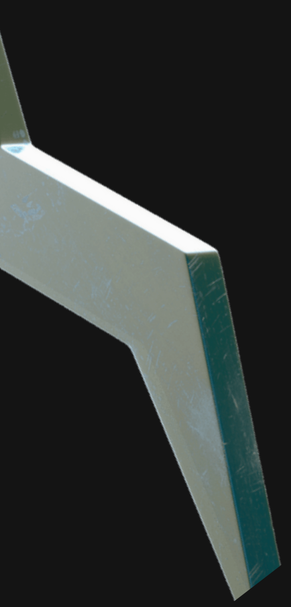


Explanation

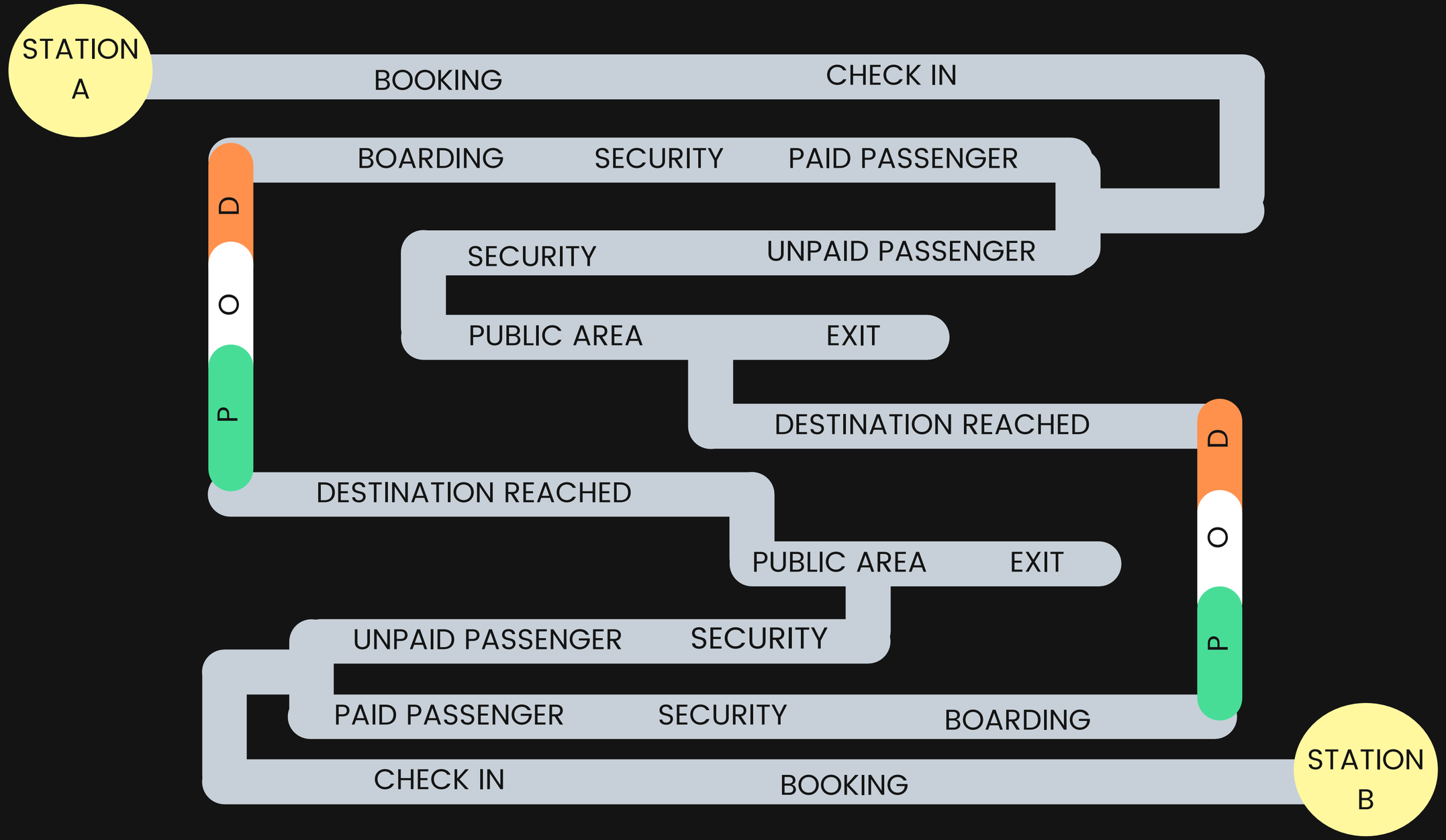


Pod Damage

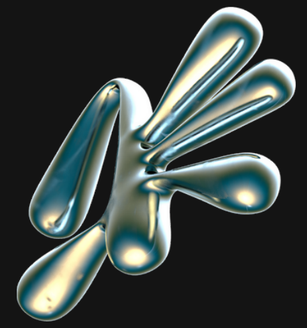
- Our program counts each new pod arriving in the platform and checks the running status of the pod and its damaged status.
- If a pod is found to be damaged then the next pod available is assigned to the bay designated to the damaged pod.
- This way every next pod is shifted to the available pod bays.
- To maintain the running efficiencypassengers are alloted pods on the basis of first come first serve, so if few seats are left in a pod then the next available passenger assingned for the next pod are allocated a seat available in the pod.
- To maximize efficiency, the dwell time between each pod is reduced by half.
- This process is continued until a nominal passenger flow is reached.



PASSENGER FLOW


STATION A
BOOKING
CHECK IN
BOARDING
SECURITY
PAID PASSENGER
SECURITY
UNPAID PASSENGER
PUBLIC AREA
EXIT
DESTINATION REACHED
DESTINATION REACHED
PUBLIC AREA
EXIT
UNPAID PASSENGER
SECURITY
PAID PASSENGER
SECURITY
BOARDING
CHECK IN
BOOKING
STATION B
D
O
P
D
O
P

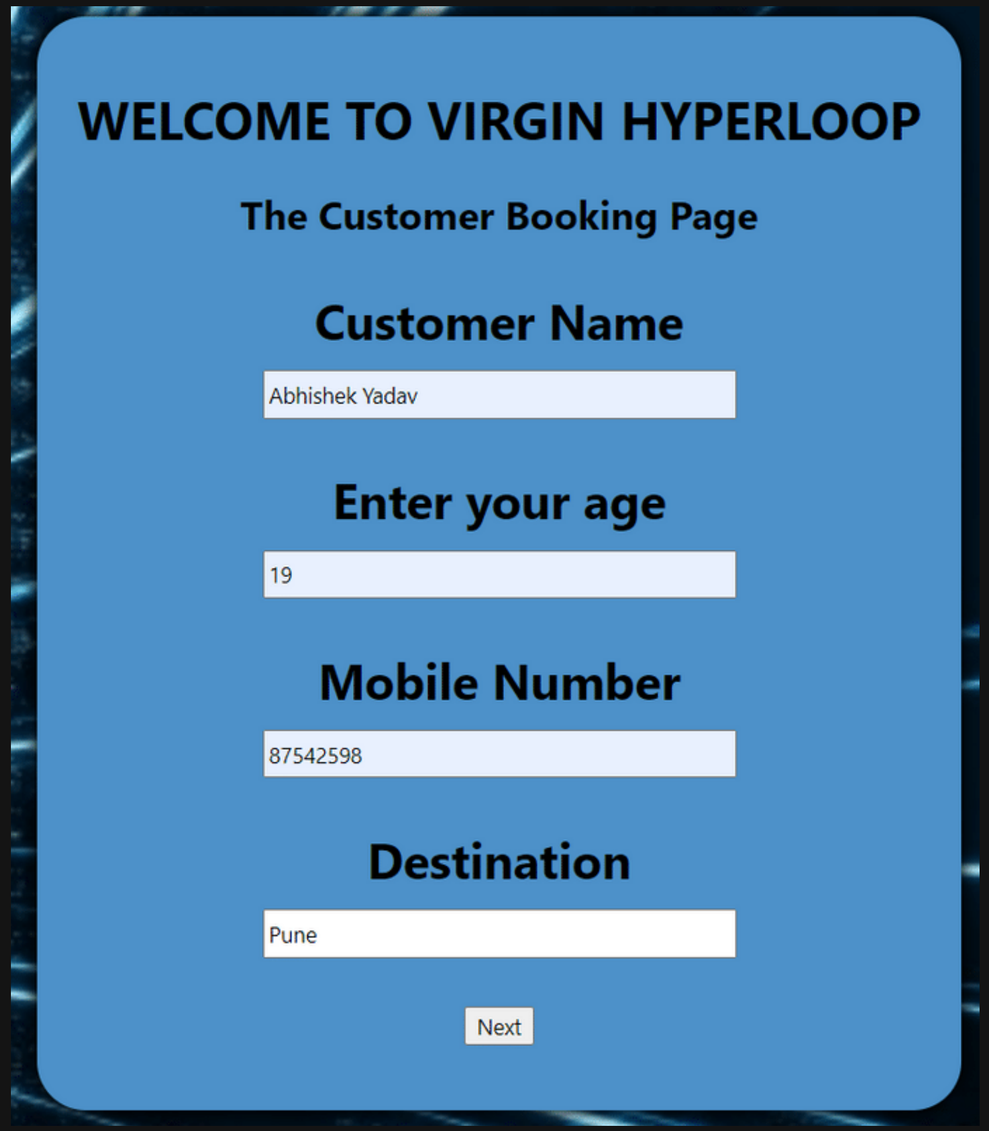
Current Development stage

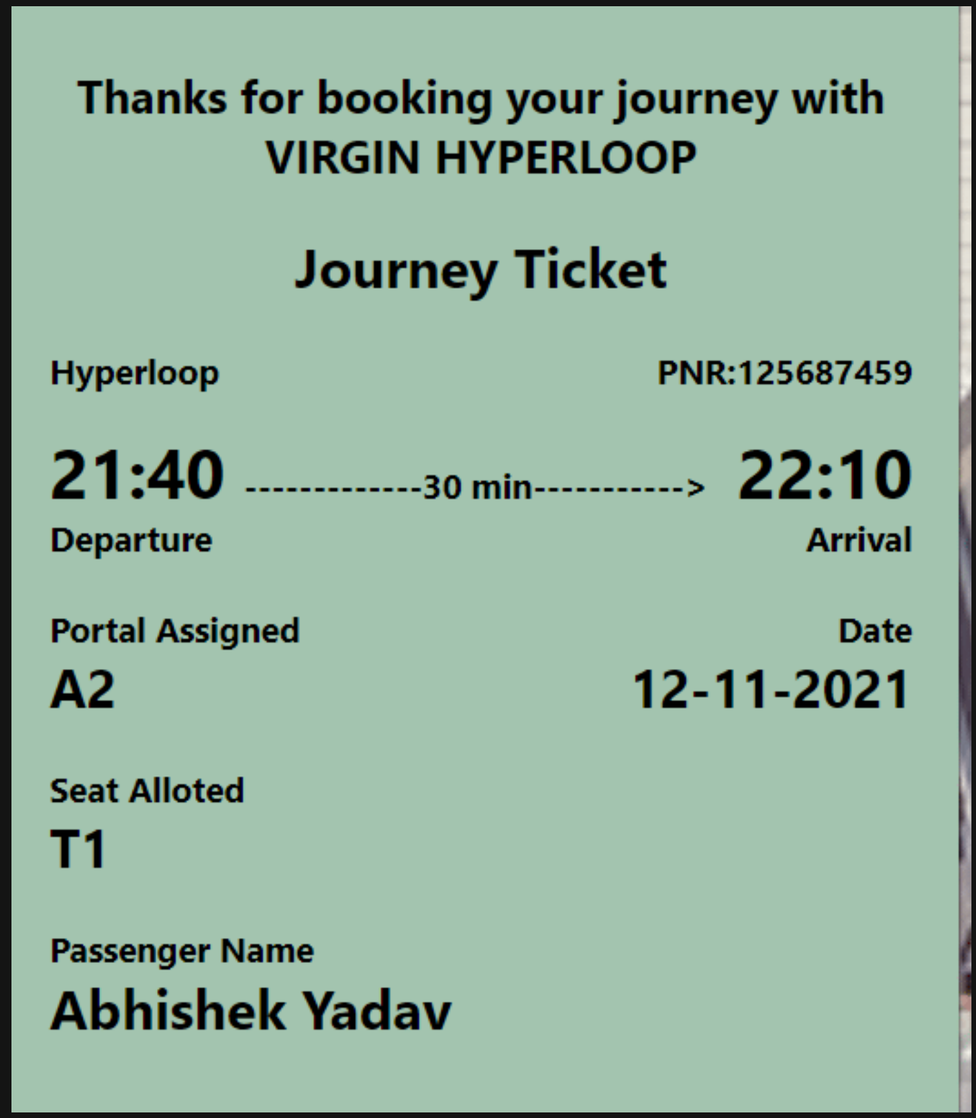


We have established a framework for the program for detection of the pod and whether it is damaged or not. The program also detects the passenger flow and overflown passengers to minimize the time taken by each passenger to reach their destination.

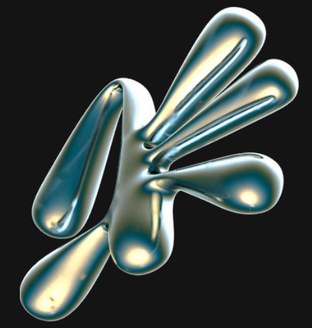
- The flask server for the program has been deployed.
- We used flask_wtf for the making of customer sign-in forms.
- We have also completed the design of the output form with variable placeholders.
- Backend code for storing customer data in a text file is completed. It provides real-time data of customer booking.Backend code for storing customer data in a text file is completed. It provides real-time data of customer booking.
- We are currently working on the Pod Bay allotment program for bug fixes.
- We have presented the idea and are writing a program for pod allotment and customer flow management during an emergency.

PRODUCT IMAGES





Novelity of approach



- Our automated approach maintain data of customer entry looking and departure.
- this allows us to maintain a record of customer data.
- the allotment program allots [pod bay rather than pods to each passenger. This allows us to check for available pods and assigns them.
- We have two different program, that allot customer their bays and pods their respective bays. this helps us to manage the passenger in an emergency environment when pod alloted fails to work.
- when a pod bay fails then the server starts another program to rearrange passenger to available bays.

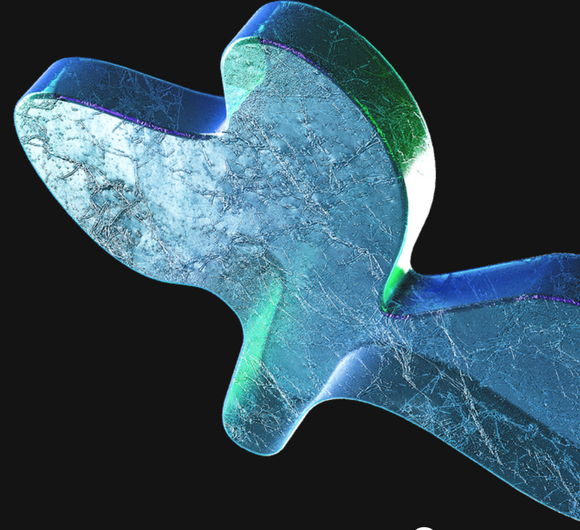
Languages

Programming languages and frameworks used in creating the program are :

- PYTHON
- HTML
- CSS

- FLASK
- FLASK_wtf
- JINJA

Conclusion



Team LEVITATION feels glad to contribute idea of management for Virgin Hyperloop in INDIA for Mumbai-Pune route. We have analyzed and tried to give solutions for various problems which can occur during passengers journey. Passenger flow is prepared in such a way that no crowd gathering occurs. Our idea totally focuses on saving time of passengers and providing them comfort during their journey.

To check our projects current status, please follow the link to the program GitHub repo. 👇

https://github.com/mohit2pal/Levitation