Embraccess

peace of mind - independence - control

Project Background

According to the World Health Organization, **1% of the world's population needs a wheelchair**, a number that is bound to increase with the global ageing phenomenon. Wheelchair users are able to enjoy every activity they want, yet due to the hostile airplane environment, they **struggle to find comfort and independence during the flight experience.** The challenge is how will Embraer be able to guarantee that people with disabilities get the same rights and are treated with the same dignity as all others.

Need Statement

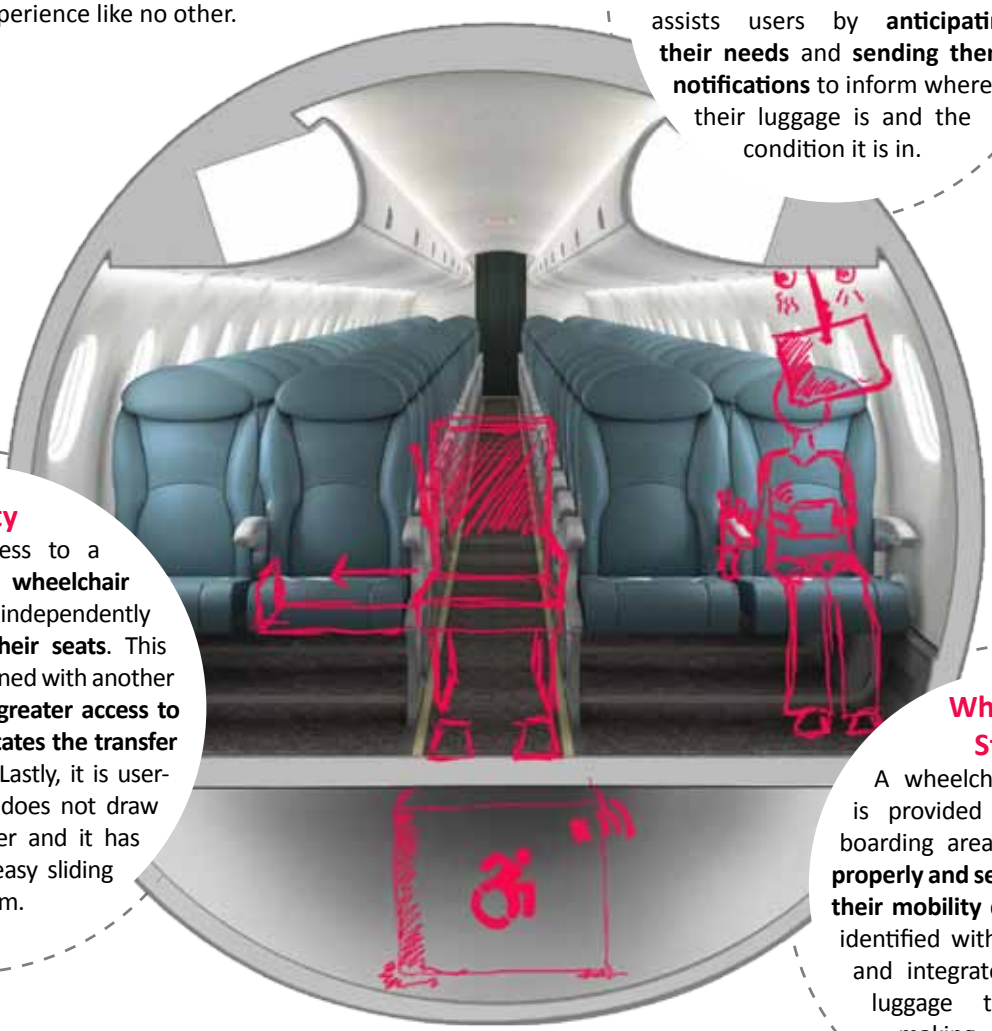
Imagine that you are required to gate check your bag which has something valuable or precious in it. You immediately **panic.** Now imagine if it was your wheelchair. **Your legs. Your independence.** What if you have no clue how you are going to move inside the cabin now that you don't have your chair? What if you can't be sure that you will be able to move after your flight, because your wheelchair may not make it safely to your destination? For our users, this is their **bitter reality.**

Our vision

We will create a more desirable and accessible experience by tackling the problems of mobility and comfort inside the cabin as well as the storage and security of the user's assistive device. With these two systems, we will be able to give our users the independence and control they desire, the peace of mind about their assistive devices they deserve, and an experience like no other.

Smart Cabin

By using an app, users are granted **control over their environment**, from turning on the light, to redirecting the fan. The smart cabin also assists users by **anticipating their needs** and **sending them notifications** to inform where their luggage is and the condition it is in.



Mobility

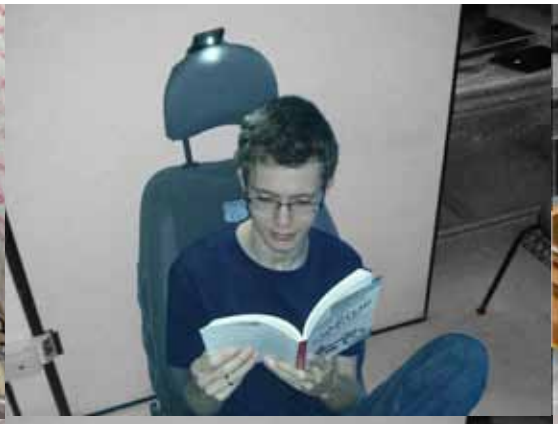
Users have access to a **redesigned aisle wheelchair** that allows them to independently **slide in and out of their seats**. This wheelchair, when combined with another sliding device, provides **greater access to onboard WCs and facilitates the transfer between wheelchairs.** Lastly, it is user-friendly because it is does not draw attention to the user and it has an intuitive and easy sliding mechanism.

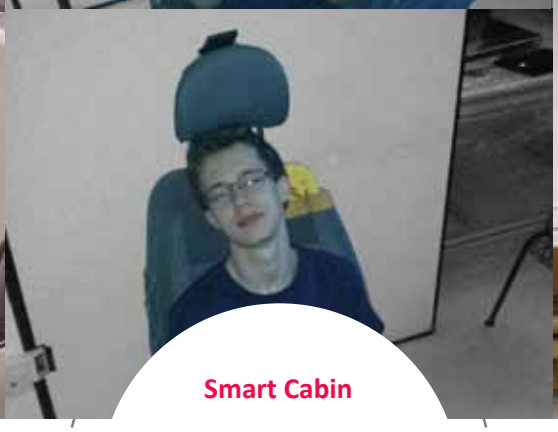
Wheelchair Storage

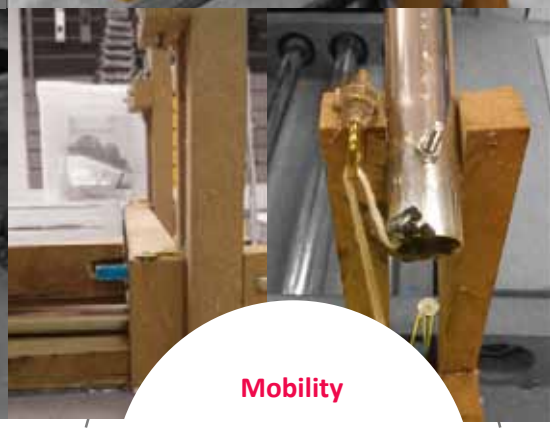
A wheelchair storage case is provided to users at the boarding area, allowing them to **properly and securely store and seal their mobility devices.** Each case is identified with a unique QR code and integrated to the airline's luggage tracking system, making these items **trackable**.

Design requirements light | safe | maintain passenger capacity

Prototypes







Wheelchair Storage

A **special case** designed for storing a wheelchair with foldable walls and docking system. A **notification** of a user's **stowed wheelchair** represented on a display.

Smart Cabin

Simulating a system which **anticipates the users' needs** (e.g. reading a book) and **performs an action** (e.g turn on the lights).

Mobility

Simulation of the **lateral sliding and latching mechanism** based on the position of the armrest. Use of bearings, aluminum, and wood, among others.

Learnings

While we are designing for the wheelchair user's experience, our products must seamlessly integrate into or improve the current systems utilized by the cabin and airport crew.

The systems utilized by the airport personnel needs to have clear instructions and the process must take the least amount of time possible.

By simulating how the user would interact with the product, we were able to develop a more user-friendly latching mechanism. Armrest up, unlocked seat and vice-versa.

Next steps

We are looking into different types of telescoping designs as well as inflatables for the storage device's retractable light-weight walls that protect the wheelchair.

Our current tracking and control system utilizes MATLAB and we will be migrating that onto an iOS or Android platform.

Our focus will be directed to minimizing the need for adaptations on the plane as well as decreasing the weight of the aisle chair and transfer mechanism.

Maria Barrera - Laura Hoinville - Clifford Bargar
Erika Finley - Robert Karol

Guilherme Kok - Amanda Mota - Luiz Durão
Rodrigo Monteiro

EMBRAER

Brazilian aircraft manufacturer world leader in regional jets

scan here to learn more