

Accessible aircraft seat and console controls for passengers with disabilities through mobile devices

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I. INTRODUCTION

People with disabilities usually face difficulties during travel in aircrafts. Among these difficulties, there are limitations while seated during the journey. The seat and console controls may be hard to reach and use or not accessible at all.

Considering the trend of airliners to allow the usage of wireless devices during flights, personal mobile devices become an option for improving comfort and creating a better experience for passengers with disabilities.

II. METHODS

This project is part of a larger project focused in the development of assistive technologies for improving the flight experience for people with disabilities or reduced mobility.

The project follows a methodological approach based on design thinking. The design thinking approach includes an initial project stage focused in the user understanding, followed by successive ideation and prototyping cycles.



III. DEVELOPMENT

The project includes a conceptual prototype that allows for a passenger with disabilities to make use of the IFE controls, the seat controls and the controls of the console above the seat using his own mobile devices.

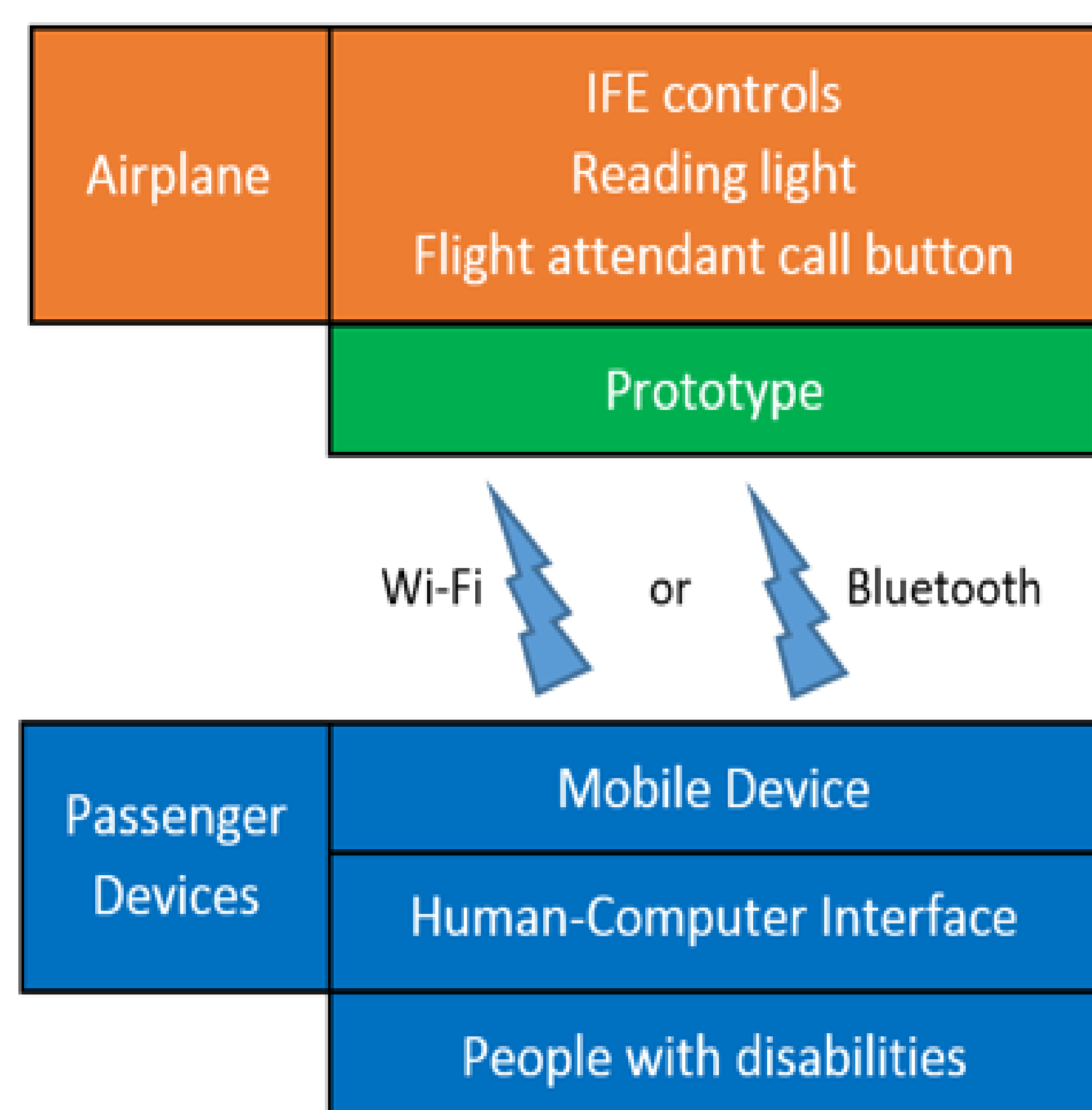


Fig. 1 Prototype architecture

The prototype provides twelve basic electronic functionalities, chosen after examining the most recent aircraft in-flight systems and understanding the user experience during the flight.

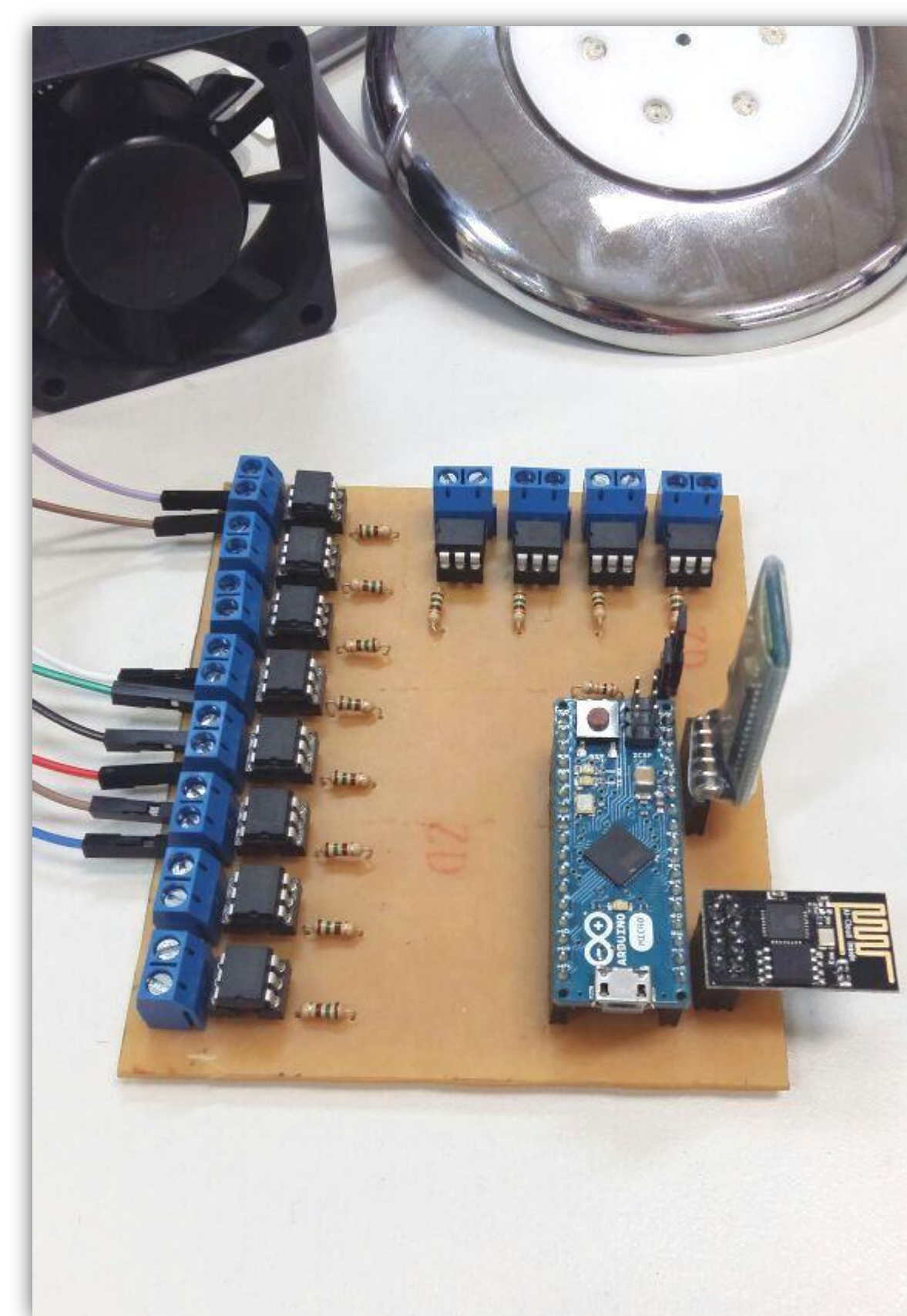


Fig. 2 Functional prototype

The functional prototype was built using solid state relays, an Arduino Micro, a HC-05 Bluetooth module and an ESP8266 for Wi-Fi communication.

IV. RESULTS

The switches of the IFE controls, reading light and flight attendant call button of the aircraft represented in the final prototype were placed in parallel with solid state relays controlled by the Arduino.

The Arduino connects to a mobile device using Bluetooth or Wi-Fi and is controlled by a mobile application developed for this purpose.

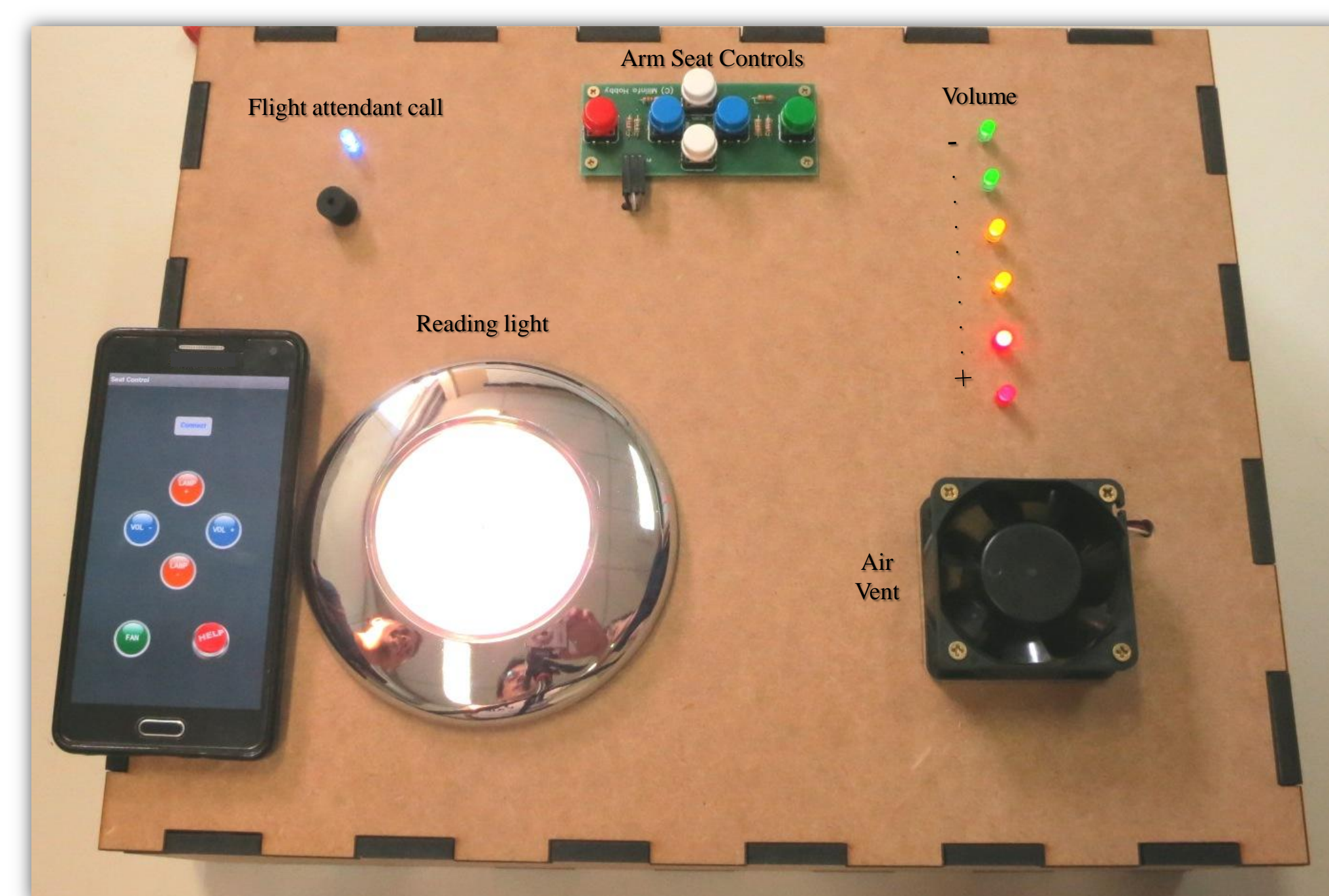


Fig. 3 Final prototype

V. CONCLUSIONS

The solution designed in this project is focused on the users' requirements, specifically for those passengers with disabilities.

For people with disabilities, it means enabling their accessibility through the connectivity of their own personalized solution to the existing aircraft controls.