WHEELTRIP
A HOLISTIC APPROACH TO IMPROVING PASSENGER EXPERIENCE FOR THE DIFFERENTLY ABLED AT AIRPORTS

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CE / SE / IE / Social Work/ Business Administration – FAA Smart Airport Student Challenge

EXECUTIVE SUMMARY

The differently abled population often reports having an unpleasant airport experience. In fact, 65% of individuals with disabilities have had issues with the airport themselves []. For the almost four million Americans requiring a wheelchair, navigating the airport is not an easy task, and many wheelchair assistance companies receive poor reviews. Our project, "WheelTrip", was created to assist differently abled individuals when navigating airports and requesting a wheelchair. Our mission with WheelTrip is to empower differently abled passengers throughout their end-to-end journey, which should be joyful for all passengers. This includes allowing passengers to communicate with wheelchair assistants (WCA) prior to arrival, ensuring they have timely access to a wheelchair, and provide navigation inside the airport. WheelTrip was created by a uniquely interdisciplinary team, comprised of students from the engineering and social work departments to provide a greater impact to those we serve.

BACKGROUND

- Around 36.6 million adults in the United States report having a disability, and 71% of these adults travel at least once in the span of two years [3]. However, for many adults with disabilities, travel by air presents a myriad of difficulties.
- Four challenges passengers in wheelchairs face at airports are waiting in long lines, meeting airport personnel unaware of services, feeling unwelcomed, and encountering delays in accessibility services [3].
- Shortening lines can benefit older adults and people with disabilities. Older adults can become tired from walking long distances in airports [1]. Walking to the check in counter or connecting flights is also arduous for some older adults.
- New technologies can be daunting and anxiety-evoking to older adults who are unfamiliar with them [5], consolidating the number of applications and websites a passenger must access can make pre-planning and execution of the trip less stressful for older adults.
- Waiting for a wheelchair is often an exhausting task [1] and navigating through the airport afterwards only exacerbates the fatigue.
- Using a personal attendant to assist with navigating the airport can make the individual in a wheelchair feel awkward and deprived of autonomy [4], which is a barrier to social access.
- Evidence suggest that there is lack of communication between the airline and the third-party provider who the WCA is employed by.
- According to FAA Advisory Circular 150/5360-14A: Access to Airports by Individuals with Disabilities [2], "airports are required to take appropriate steps to ensure that their communications with individuals with disabilities are as effective as communications with other individuals, beneficiaries, and members of the public.

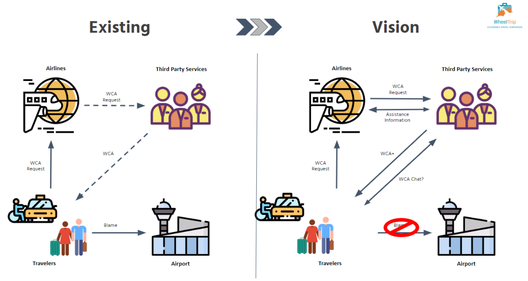

Figure 1. Root Cause

CONCEPTUAL DESIGN PHASE

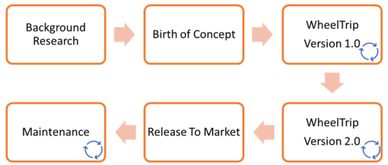

Figure 2. Concept Lifecycle

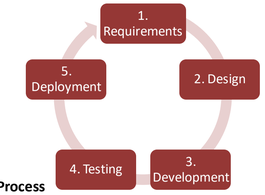

Figure 3. Iterative Design Process

- Travelers will begin their journey from their "home" (hotel, home, friend's house etc.)
- Travelers will be redirected to Google Maps for directions to the airport.
- Once the traveler is close to the airport, he/she will be able to request their wheelchair. Travelers would then be able to communicate directly to local assistive services to meet.
- The traveler will have options to navigate the airport using an indoor map and if needed, communicate their needs to their attendant.
- Once traveler boards plane, phone will be put on airplane mode.
- Steps will be repeated in reverse order as traveler lands at destination airport. Traveler will be asked for confirmation of service provided.
- Upon completion of the semi-structured interviews, we made our first major upgrade to WheelTrip and created WheelTrip 1.1.
- WheelTrip 2.0 is planned to be released at a later date with additional updates that could not be added to WheelTrip 1.1.

DETAILED DESIGN PHASE

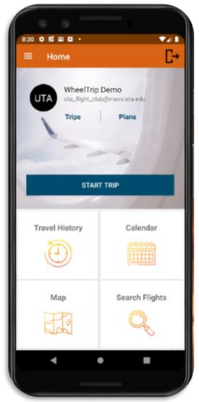

Figure 4

- The home screen is the primary menu for users to access most features of the app and assist with trip planning. Users can begin their journey (travel session) by selecting Start Trip.

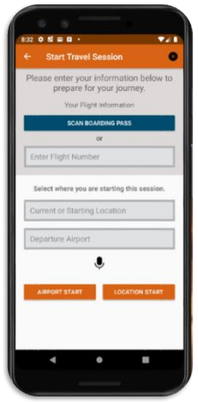

Figure 5

- Once users begin their travel session, the user will see this page. Here, the user will be prompted to select their start point and enter additional information. After navigating to the airport or if the user is already there, they will be asked to make a service request.

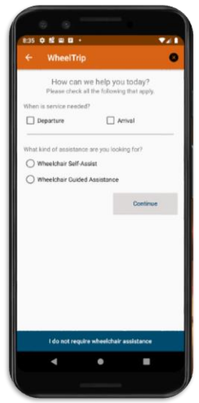

Figure 6

- The service request asks the user when service is required and what kind. Following their submission, the request will be received by a third-party service provider and should meet with an attendant shortly. If necessary, an option to directly contact these services will be available.

Figure 7

- Once the WCA has arrived with the user's wheelchair, the user can then alert the WCA of where they would like to go or use it to navigate the airport themselves. The drop-down menu has a list of options including restrooms, airline check-in, food/retail, chapel, assistive care, or directly to the security checkpoint.

*Figures above reflect current designs implemented in app

PROTOTYPE & TEST

- Semi-structured interviews were completed to receive validation of WheelTrip 1.0.
- We had two participants who were both white, female, and between the ages of 70-85
- Feedback received was used to create WheelTrip 1.1

Feature	Useful?	Direct quote:
Indoor Mapping	Useful	"Give us a bloody map! We really need a map, especially for a airport like Chicago O'Hare."
Communication directly with WCA.	Not Useful	"I don't know if the WCA needs more work to do, they are so busy […] If they have to stop and chat with you it could increase delays. I don't want to do that to that poor person."
Scan Boarding Pass	Not Useful	"Most people who are capable of using this app, already have the [boarding] pass on their phone."
Directions to Baggage claim and Restaurants	Useful	"Add Restaurants! I mean if you got a 3-hour layover […] people want to look for a sit-down restaurant. Get off my feet."

Figure 8. Results of semi-structured interviews

CONCLUSION

- The need for change to be implemented toward this population is evident from FAA and from preexisting literature.
- Evidence shows that older adults and persons with disabilities are wanting and eager to travel more frequently and longer in life.
- Our vision for WheelTrip is to bridge together miscommunication that is seen between the airline, third party providers, airports, and passengers.
- We strive to make the travel experience for older adults and persons with disabilities joyful and continue to promote autonomy for the passenger.

REFERENCES

[1] Duerstock, B. S., Allen, A., Berger, C., Brennan, K., Brouwer, H., Celeste, P., ... & Engstrom, H. (2019). Report on the Challenges of Air Transportation Experienced by People with Disabilities.

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[5] Giacomo, Dina Di, et al. "Psychological Barriers to Digital Living in Older Adults: Computer Anxiety as Predictive Mechanism for Technophobia." *Behavioral Sciences*, vol. 9, no. 9, 2019, p. 96., doi:10.3390/bs9090096.