



LEFT IS STOP RIGHT IS GO

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WHY PILOTS

Our group took a challenge in designing for unique driver type, which is pilots. Unlike car drivers, they drive in a 3D dimensional space that involves complex operation more than just drive and reverse function. We decided to study this unique context of pilots for our interface design.

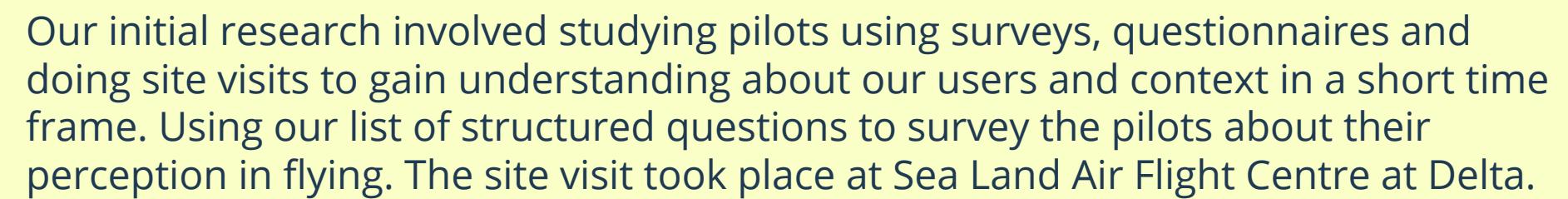
CONTEXT INTERESTS & USERS

Our design focuses on context of new pilots with goal of getting 'private pilot license'. The pilot's work involved attention to many different instruments and environment they fly in before and during the flight. To assist these novice pilots, we wanted to improve their flying experience and reduce heavy cognitive load that car drivers would not face in their driving experience.



INITIAL RESEARCH

Our initial research involved studying pilots using surveys, questionnaires and doing site visits to gain understanding about our users and context in a short time frame. Using our list of structured questions to survey the pilots about their perception in flying. The site visit took place at Sea Land Air Flight Centre at Delta.



RESULT OF INITIAL RESEARCH

After examining the answer to questionnaires, we found out that pilots like to fly because it is fun, addicting, and thrilling. However, the process of becoming a pilot requires a person to go through series of exams and ability to fly solo while being a responsible driver when flying. Learning to fly is most important hands on experience for pilots.

DESIGN GOAL

The goal of this application is a learning tool to help novice pilots with planning their flights and reviewing their performances. Based on notes they have made during flight, it can help for





PROTOTYPE

Our prototype of flight application, Air Log, provides user with three options: create new flight entry, previous flight entries, and review performance. In the first two options, the three forms, navigational log, waiver form, and itinerary form, have been reformed into step by step process. The review performance page allows user to reflect on their actions during the flight and feedback that will be input by the instructor.

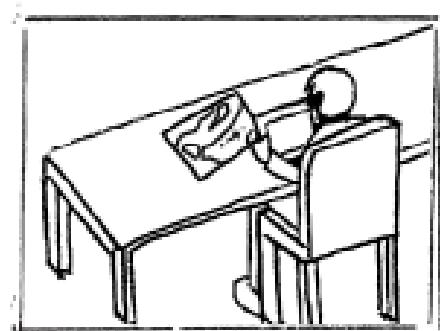
DESIGN PATTERN

AirLog has a structural interaction design pattern with navigational pane on the right, slide in window and overview pane on the left.

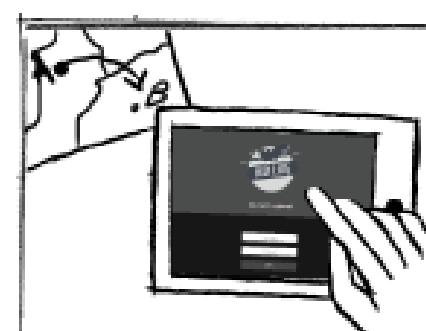
Our design is for the platform of an iPad. The forms are available in a pattern library for users when creating new flight plans.

DESIGN PRIORITY

Our primary focus is to create a concise form that reduces heavy cognitive load in the current form design. We organized the forms into more coherent one by filtering out the contents and regrouping the information that needs to be filled. The interface aims to assist users to learn from their experience.



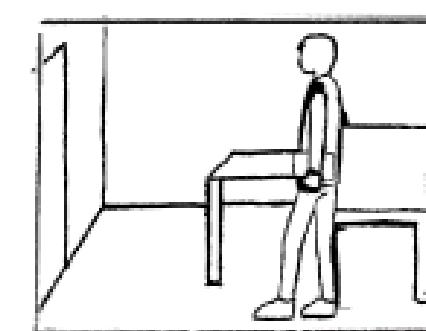
The pilot turns on the tablet to plan his flight.



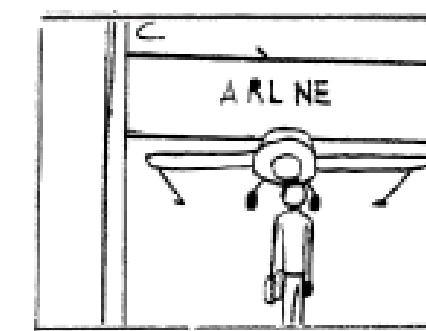
The pilot inputs all the data (weather, where they are travelling, etc.)



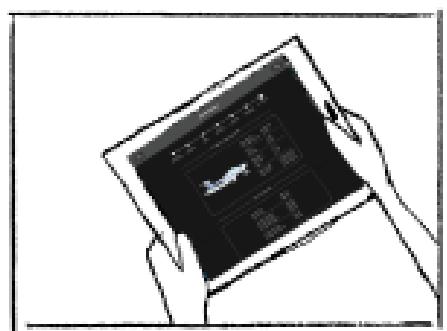
- a. check points + conditions
- b. emergency itinerary
- c. flight information + checklist



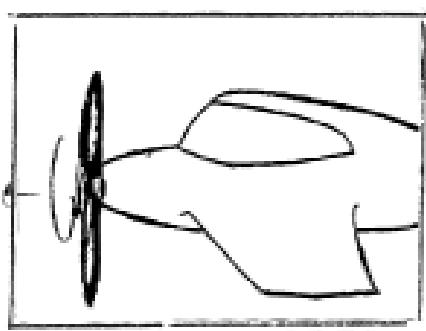
After filling in the forms, the pilot heads out to his plane.



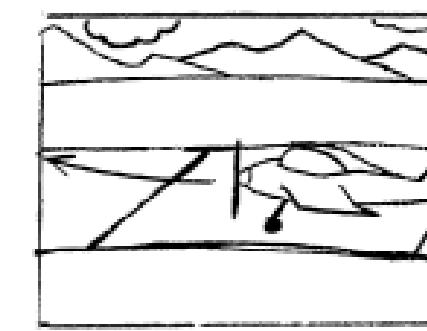
The pilot checks the oil, engine, and other equipments on the plane to make sure it is safe to fly.



"Ok, let's check my flight plan." The user scan through the checklist to make sure they did not forget anything last time.



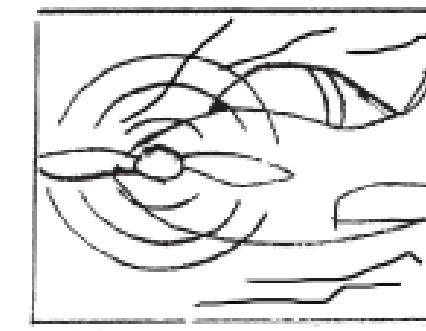
Starts up the engine,



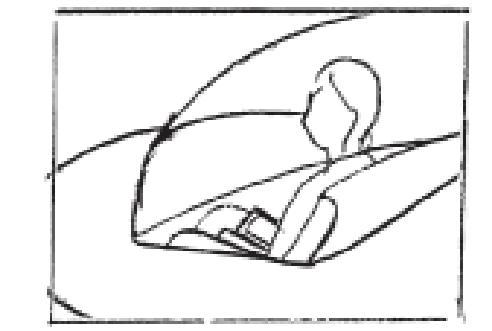
The plane takes off.



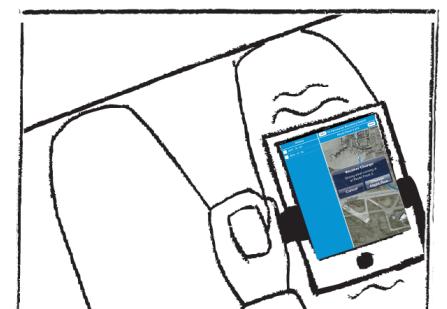
The pilot looks at the meter to make sure he is on the right track so far.



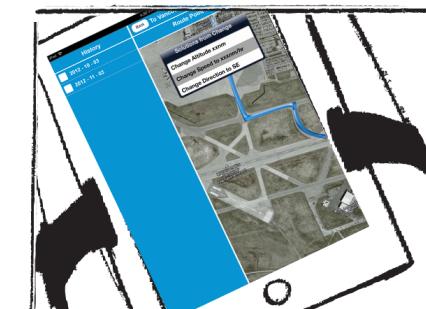
The wind causes turbulence.



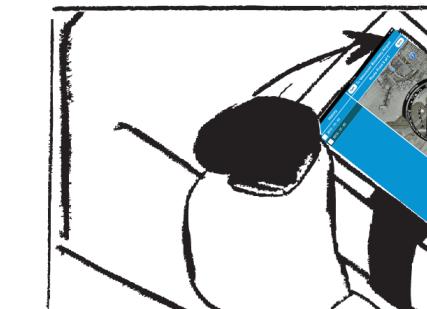
User looks at the meters and looks outside to check his current location. He notices that he is off course.



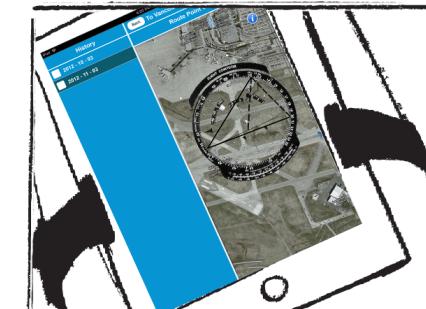
The tablet vibrates and notifies the pilot the data they need to get back to the right course.



Quick update of the data allows the pilot to know what to do immediately.



The pilot turns the plane to an angle to correct the course of the flight.



The screen vibrates again and updates new data. It also let the user know that they are back on track.

STORYBOARD & TASK

EXPERT REVIEW AND THINK ALOUD

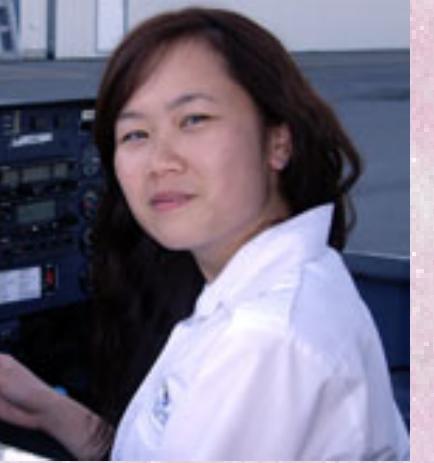
Our design team used Expert Review and Think-aloud as method for user research and interview. We chose few experts and student at Sea Land Air Flight Centre as our participants to reflect on our interface from two different perspectives: student pilots and instructor. During the user testing, we asked the participants to perform three different tasks that involves going through three main options: creating entries, previous entries and reviewing performance.

OBSERVATION NOTES



PARTICIPANT1 **PIPER**

He has been flying for 6 years and grew up in an aviation family. He is now an instructor at the Sea Land Air Flight Centre. When he starts creating a flight plan, he was impressed by how detailed we have incorporated the form items. Although indicating some items are not necessary.



PARTICIPANT2 **ESTHER**

She has been flying for 10 years and studied Airline and Flight Operations Commercial Pilot Program and is also an instructor at the Sea Land Flight Centre. Esther always knew about our application and was excited to explore through the different features.

PARTICIPANT3 **GARY**

He has been flying for a year and it is his goal to become a commercial airline pilot in China. At first when Gary saw our forms, he was pleased that some basic calculations were done for him. Also, he was amazed when reviewing his performances because then he will know what he have done wrong.

ABOUT INTERVIEW

INTERVIEW WITH PARTICIPANTS

We asked the participants with semi-structured questions to help us focus in collecting qualitative data to truly understand information required to implement for the pilots. From the expert review, we learned that majority of students does non-cross country flights, which lead to some changes in our interface.

FEEDBACK FROM PARTICIPANTS

Expert Review gave us many valuable information on what information that pilots need and what is not needed. They pointed out that some information that needs to be fill in are unnecessary since they are for cross-country flights; the majority of students flies non-cross country. As for student pilot, he told us that interface was simple and concise.

THE ISSUES WITHIN

Using heuristic evaluation, we reviewed our interface and discovered that there was moderate to serious problem with error prevention, flexibility and efficiency of use, help and documentation. Aside from heuristics, we realized that system is incapable of tracking user's activities in detail.

MEASURE TO ADDRESS THE ISSUES

Route Point 1 of 6

! [Red Exclamation Mark]

Evaluations

End Flight and Save

Send to Flight School

Step 7 of 7

Personal Information | Aircraft Information | Pre Flight | Weight Information | Flight Information | Emergency Information | Confirmation

Flight Information

Flight Rules: VFR
Tail Number: C-GPDP
Colour: Blue

Type of Aircraft: Diamond Katana
Type of Flight: Controlled VFR General Aviation

Form Status

Waiver Form:	Approved
Itinerary Form:	Approved
Personal Information:	Complete
Aircraft Information:	Complete
Pre Flight Information:	Complete
Weight Information:	Complete
Emergency Information:	Complete

Send to Flight School

Step 7 of 7

Personal Information | Aircraft Information | Pre Flight | Weight Information | Flight Information | Emergency Information | Confirmation

Departure

Aerodrome Time

Date

Destination

Aerodrome Time

Date

Journey

Cruising Speed Altitude

Total EET Hours Minutes

Destination Aerodrome

Frequencies	133.100	ATF	124.000
Tower	118.7	Ground	121.7
Density Altitude	1056 feet	X-wind Component	20 km/h
Takeoff Distance	7300 feet	Ground Roll	127.15
Landing Distance	9940 feet	Ground Roll	121.70

Next

Step 5 of 7

CHALLENGES AND OPPORTUNITIES

We faced multiple challenges from understanding both the novice pilots' needs and their wants. Designing forms gave us a hard time due to the abbreviations and physical bad designed forms. We see that this is the same for novice pilots as well so we simplified things for them. Interviews and research were done to understand cognitive load for novice pilots. By notifying errors and providing tips, we hope to reduce their cognitive load. Lastly, it was difficult to find a way to help novice pilots to rate their performance but we managed to find all the criterias for flight tests.

THE CHALLENGES



AFFECTING THE INTERFACE ON THE LIVES OF PEOPLE IN THE CONTEXT

We believe that after numerous interviews and changes to our interface that it can be used as an ultimate tool to help novice pilots success for the start of their flying journey. This is all because of the convenientcy to completing the paperwork, navigation and performance tracking.

"I found what is better way to go than it would find me. It gives me a better way to go than it would find me."