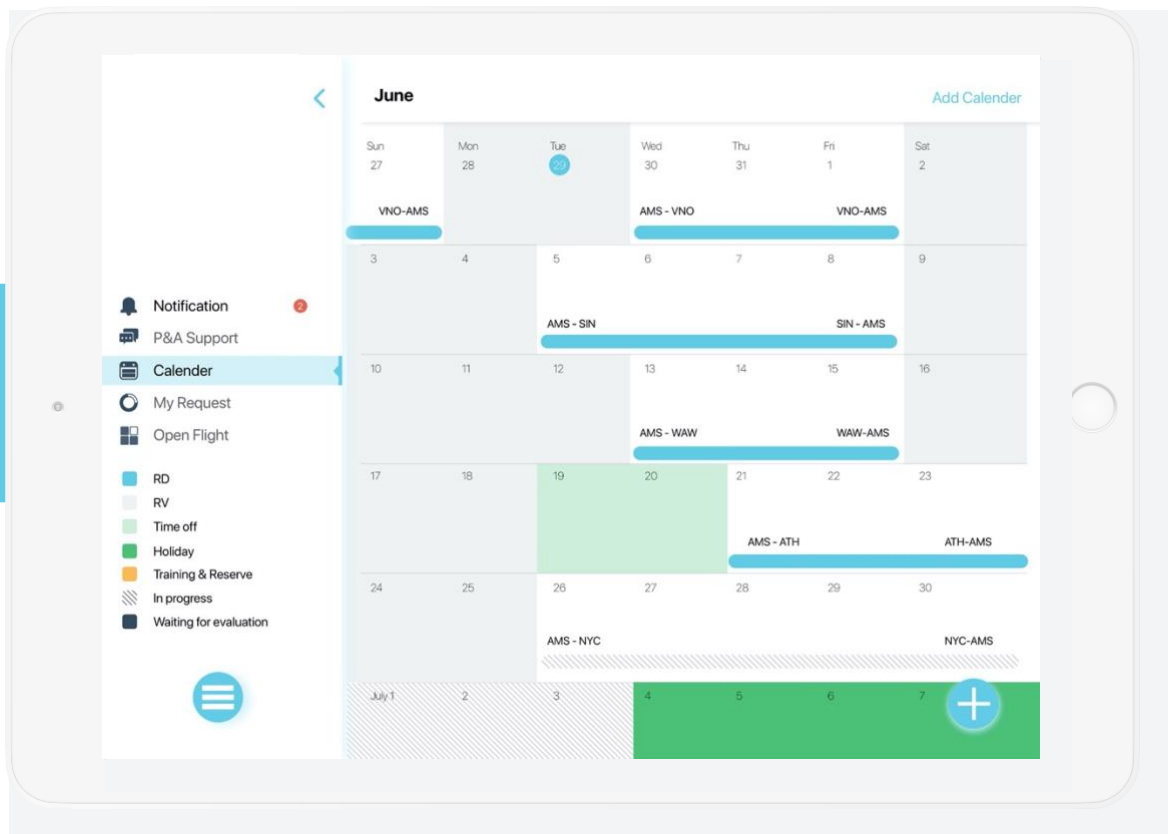


A Mobile Roster Application for FlyCo Cabin Crew

Designing a user interface concept for the FlyCo Roster Front-end System



Master Graduation Thesis
by Jen(Jieni) Liu

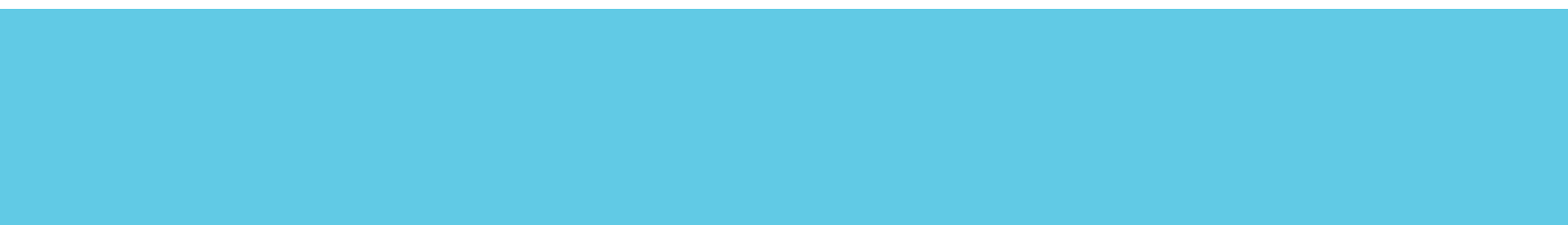
MSc Design for Interaction Faculty of Industrial Design Engineering
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Company project from:
FlyCo





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Sincerely,
Jen Liu



LIST OF DEFINITIONS

- **Cabin crew ranking:** 1 stripe & 2 stripe (Cabin attendants); Purser; Senior Purser.
- **DvU:** Day of Departure, same as DvO (day of operation).
- **M.C.C.:** Crew manager, the crew's personal manager who helps crew with personal and professional issues, similar to the role of counsellors at school.
- **Neven:** the “double role”, the crew also works as ground staff in FlyCo
- **P&A:** Planning and Assignment department, which is providing this thesis project. It provides all logistics needed to take care of the flights of all cabin crew members related to rostering (see details in Chapter 2).
- **RD: the days on the trip.**
- **RV: the days off after the trip.**

1. INTRODUCTION

PROJECT CONTEXT

ABOUT THE PROJECT

This project is related to a TU Delft master thesis and is conducted through FlyCo department. This department provides all logistics needed to take care of the flights of all cabin crew members, who are currently around 10,000 employees. Due to this large number, scheduling the rosters of all these people is a very complicated process that currently relies on a manual process. Meanwhile, with large crew groups, it is hard to satisfy the needs and wants of all crews. Through this project, FlyCo wants to improve crew's roster experience and enhance crew self-rostering for the future roster system.

ABOUT FlyCo

FlyCo is one of few airlines that allow crews to plan their weekly roster. Most airlines set fixed schedules that crew cannot change except by request. FlyCo wants optimal staff behavior by "reach out," "take ownership," "be competent" and "go further." And this project is one of strategy that they want to archive this vision.

ABOUT CREW ROSTER

Crew rostering is a process that assigns the duties to the crew member, and is also related to cost, the efficiency of operation and crew's will. "After costs for fuel, crew costs constitute the second largest expenses of an airline," (Kohl & Karish, 2004) Therefore, the rostering is the critical process for any airline to optimize.

Due to the complexity of rostering, in general, crew rostering is divided into two phases: pairing and rostering/assignment. But in FlyCo rostering, there are three phases: pairing, rostering and tracking. Pairing is the process of man powering, such as how many crews are needed, and the crew needs for each flight. Rostering is the process that assigns the numbers of crew and their positions to each flight while assessing the complex rules and regulations. Meanwhile, the rostering phase also needs to consider other activities, such as training, reserve and so on. Tracking is the monitoring phase, which helps FlyCo to have control of the operation after rostering (see FlyCo roster details on chapter 2).

PROJECT DESIGN BRIEF

The goal of this project is to design a user interface concept for the FlyCo Crew Roster Front-end System. FlyCo is

currently working on developing a vision for a new rostering system, but they don't have deep Insights yet into the needs and wishes of the main user, the FlyCo crew member, with regard to planning flights in order to design and implement a more user-friendly system. Also, they lack a clear design direction to guide the development of the new System. In order to do that, I need to know the current situation which includes front-end and back-end systems, its operation process, and operating department, as well as the main user, the FlyCo crew, and their current experience.

EXECUTIVE SUMMARY

The project has four phases: Explore and Understand; Define; Design; and Evaluation. Figure 1 is a visual representation of this process.

In the first phase, Explore and Understand, background research and user research (Chapters 2&3) are conducted. The purpose of background research is to explore the context, and to understand the current system, department, and roster process. It is performed by studying the internal documents, and by interviewing the P&A department and other FlyCo employees who may be involved with the roster, observation, and trying out the systems. The intention is to understand from an objective point of view the current roster system and roster process to determine the project scope. The results of the exploration showed the complexity of the existing systems and the challenge of the project.

User research incorporated the insights from the background research (Chapter 3). The study has three perspectives: the users, their current experience, and their needs and wants. From the three research methods of online survey, interviews and group sessions, the problems of current user experience, personas, and user's needs are identified and summarized. The second phase covers define, design goal, design criteria, target group, and device of the future system. The design goal guides the design direction, the design criteria and target group together frame the design, and the device of the future system sets the fundamental interface principle.

The third phase is design, applying the criteria and principles to generate the concepts (Chapter 5) and iterate the design (Chapter 6). During the iteration, the idea transforms from concept to wireframe to prototype, which entails user flow, function flow, and UI design. The whole iteration process is validated through expert reviews, which improve the prototype in preparation for evaluation.

In the fifth phase, evaluation (Chapter 7), a user test is conducted. After the iteration, an interactive prototype is ready for testing. To verify the concept and UI design, I

hosted a user testing with the real user group. The user group is selected based on the personas (Chapter 3). The measuring of this user testing is through the AttrakDiff and System Usability Scale (SUS) survey, which focuses on the usability of the project, especially from two aspects: effectiveness and satisfaction of use.

The prototype was evaluated with 10 cabin crew of mixed rank, age, and experience. The results show that the prototype has above-average quality in the effectiveness of usability and

high quality in the satisfaction of use. Overall, this prototype is very attractive to the user. Participants showed a consistent tendency toward this design over the current system. Moreover, regarding the feedback from the evaluation, a final design is presented (Chapter 8), and the limitations of this evaluation are discussed. Finally, there are a project conclusion, a personal reflection and recommendations for further research and design (Chapter 9).

EXPLORE AND UNDERSTAND

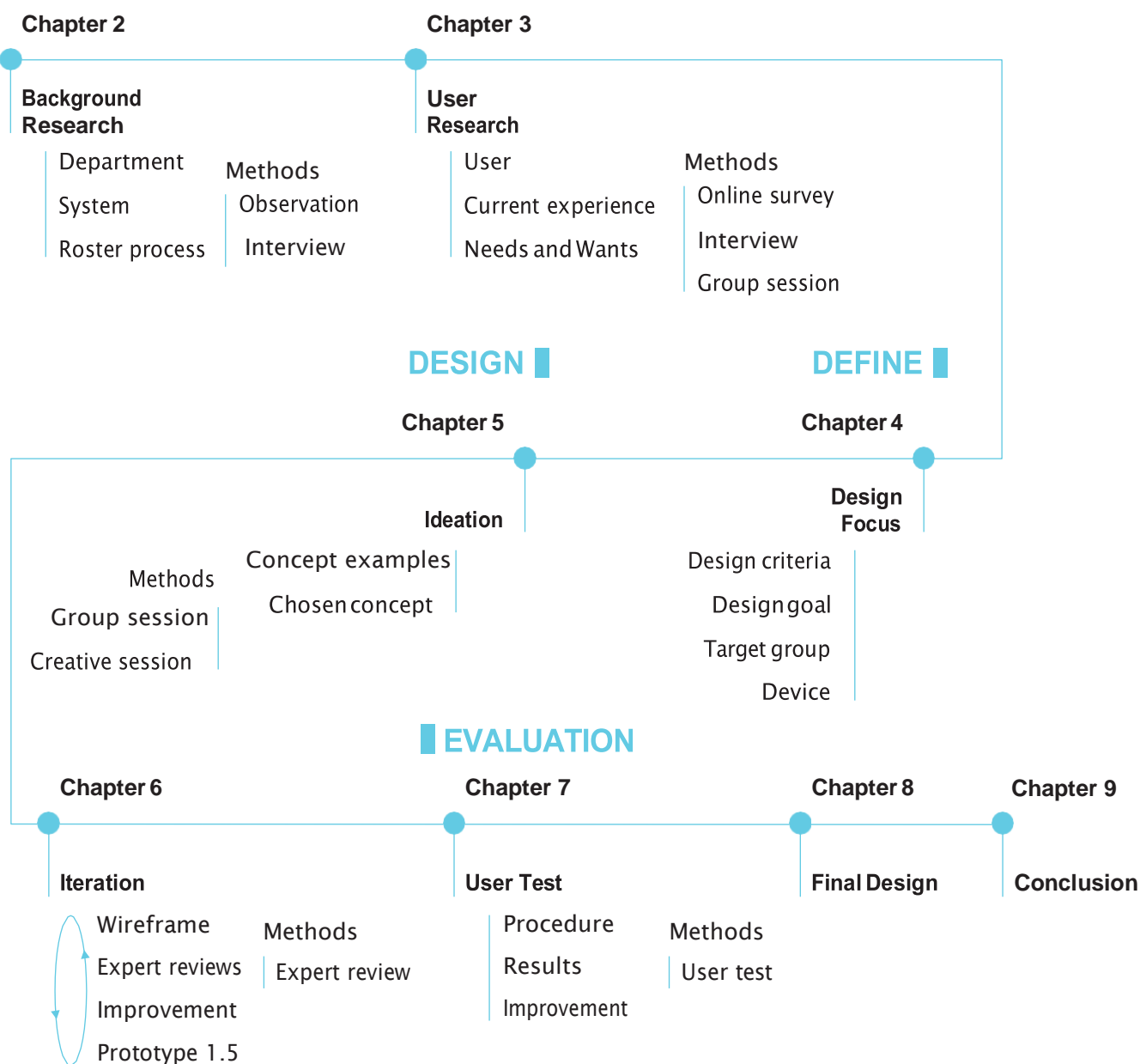


Figure 1 Executive Summary



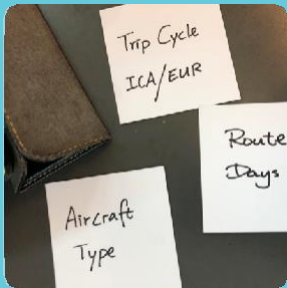


Chapter 2.

UNDERSTANDING THE CURRENT FlyCo ROSTER DEPARTMENT AND ITS SYSTEMS

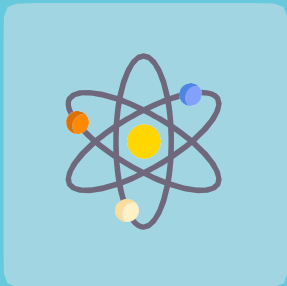
This chapter presents the background research and its results. I will introduce the FlyCo style of rostering based on my observations and analysis from three aspects: the departments, the applications, and the process. This is an important step to understand the current situation before I research user experience.

RESEARCH METHODOLOGY



During background research, I performed several research studies:

1. Interviews: with Planning units, Assignment units, P&A support team, Crew control, IT unit and Neven (work as crew and ground staff). Interviews help me to learn the system quickly, and meanwhile to get staff's personal opinions about the system and current crew experience.



2. Introductions by expert:

The experts from the Assignment team and support team, and the IT department. The experts explain the functions of the application, regulation of roster, roster process in the introductions. A straightforward way to learn the system

From the interview and introductions, I gain knowledge of how the P&A department works, the flight regulations and rules behind the system, the technical aspects of the current system, and the weekly roster process.

21 DEPARTMENT

ABOUT PLANNING AND ASSIGNMENT (P&A)

The P&A department is the roster operating department in FlyCo. P&A is in charge on rostering from the beginning pairing phase to the final phase: tracking. It also provides support when the crew has questions about the roster. The P&A department has four units: Planning, Assignment, Support team and Crew control. Each unit controls a certain period of the roster process based on the timeline.

The figure below shows the overview of rostering in P&A department, and it has three main phases of rostering: 1) Planning and pairing; 2) Rostering; 3) Tracking. Each unit of P&A is in the different stages of rostering process, and it makes their functions and responsibility lines up to the chain.

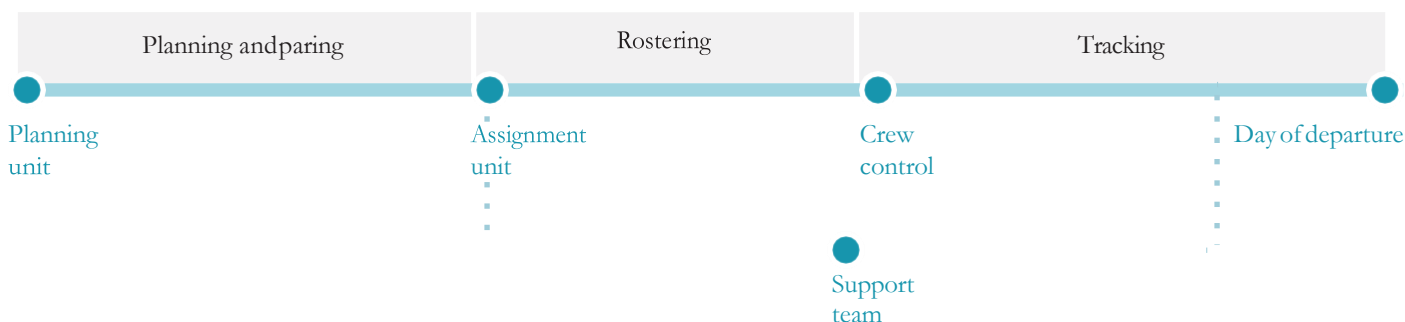


Figure 2 P&A department



22 APPLICATIONS

In the current FlyCo roster system, there is no unitive platform for both P&A staff and crew. There are five different applications in the current FlyCo roster system. In the front-end of the roster (crew's self-rostering), there are three applications: Request system (in Dutch: Verzoekensysteem), D-app and H-app. These applications were designed based on different time periods on the roster, and the purpose of use. In the back-end of the roster system (P&A's rostering), there are two main applications: C-app and iCrew. These applications were developing and changing based on the appearing needs and wants.

22.1 REQUEST SYSTEM, D-app AND HOLIDAY

The crew uses the Request system, D-app and H-app to control of their roster. The Request system organizes the working schedule (where to fly, when to fly, what kind of flight they have, etc.). D-app helps the Planning unit with the annual leave based on the crew's preferences. And H-app is the application that crew use for adjusting their annual leave which is assigned to them by the Planning unit. These three applications together form the self-rostering part of the FlyCo roster system.

Verzoekensysteem

Request system is a website application, and it is the central application that crew use for planning their roster. It connects with C-app (see page 14) . The crew can request their preferences (flight, schedule, etc.) of their roster Request system. And then the Request system will upload the crew's request to C-app, and C-app will assess the request with production and other reference values to determine the crew roster. For better evaluating of crew's request and limits the times, the Request system has the Request counter, a score counter which based on the number of granted requests (one granted request adds one point on the counter). And C-app will start the assessment of the request from the crew who has the lower request counter to highest request counter on that day.



VARIOUS REQUESTS IN SYSTEM

There are soft bidding requests and hard bidding requests in the Request system. A soft bidding request is a request that does not cost/add the request counter. A hard bidding request will cost/add one point on the request counter when C-app grants it.

In order to understand these requests, I categorized them into four groups based on functionality aspect:

1. Flight request and quick flight request

These two requests are requesting a specific trip with date, route, destination and flight.

2. Trip Preference

- Destination
- The difference from Flight request is that the crew can request a certain range of area with the departure date. C-app will try to assign the roster based on the requirement.
- Aircraft type
- Trip time: Day off, Route days
- Reporting time
- Who to work with: Open buddy

3. Time off: Time off, Part time off, Super joker

4. Work duty: Reserve, make Training

Figure 4. Request system function flow

Hard Bidding	Soft bidding
<p style="text-align: center;">Flight request Quick flight request Time off Reserve</p>	<p style="text-align: center;">Trip cycle ICA, Trip cycle EUR Aircraft type, Region Route days, Reporting time Part time off, Open buddy Superjoker, Training request</p>

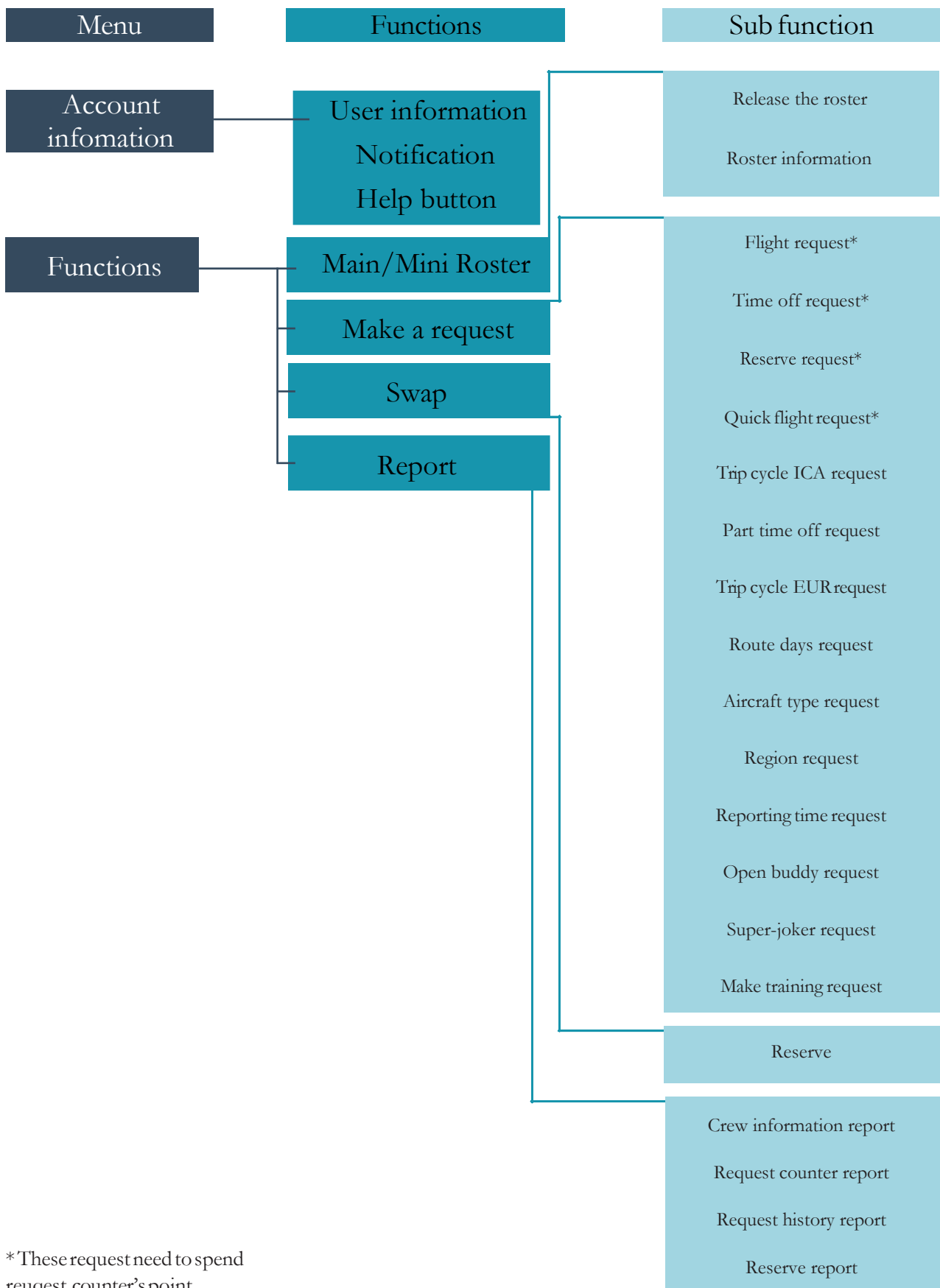
D-app: FOR HOLIDAY REFERENCE

D-

D-app is a web-form application for the crew to choose their annual leave preference. D-app is only used twice a year, for summer and winter vacations, and after a specific period, the website will be closed. After the crew submits their preference, the data will be given to the Planning unit for human resourcing.

The crew can pick the block they want to have or list out three preference vacation periods. The planning unit will make the human resource with the preference data. Tip: After submitting, the crew does not receive any updates from this website.

SYSTEM FLOW OF REQUEST SYSTEM



*These request need to spend request counter's point

Figure 4. System function flow of Request system
("Verzoekensysteem")



HOLIDAY: FOR ADJUSTING HOLIDAY DATES

H-app is a website application for adjusting granted annual leave. As with D-app, H-app only opens twice a year with the certain period for summer and winter vacation. The difference from D-app is that the annual leave in H-app is already granted by the planning unit and has been inputted into C-app. Moreover, H-app is the real-time application; cabin crew can see the results immediately after they submit the request.

Figure 6. H-app website

H-app has three main functions: Split, Direct, and Auto:

- Split: the crew can split their one annual leave to two small periods, with the system providing double starting date for the second period
- Auto: the crew can use the Auto function to swap annual leave with free annual leave period in C-app
- Direct: the crew can communicate with their colleagues through the Swap list*; if both crews want to exchange, they can type their staff number to exchange their holidays

* Swap list: When the C-app system does not have the free block that crew wants, H-app will put their name, current holidays period, and desired holiday period into swap list. In this case, the crew can find each other for swapping.

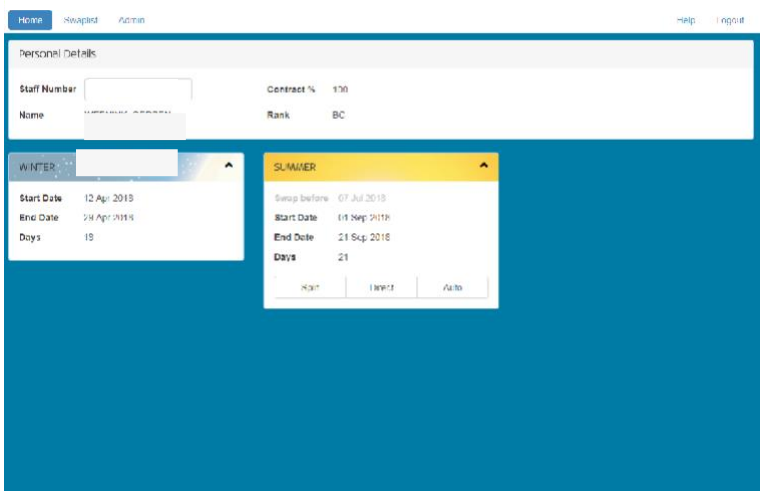


Figure 6. H-app website

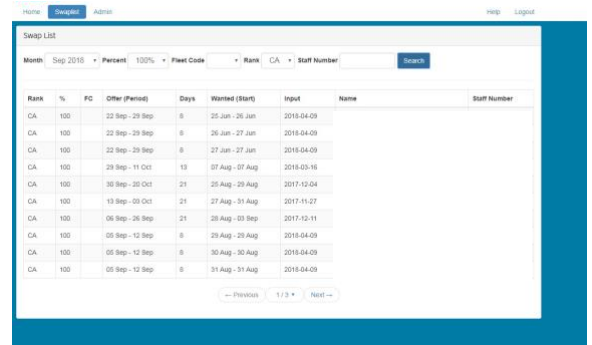


Figure 7. H-app: Swap list

C-app AND ICREW, THE BACK-END ROSTER SYSTEMS

The figure below shows the main application P&A use for their rostering. As I said previously, C-app and iCrew are two main applications that P&A uses for rostering. C-app mainly works on the rostering phase and iCrew works on the tracking phase of the crew rostering process.

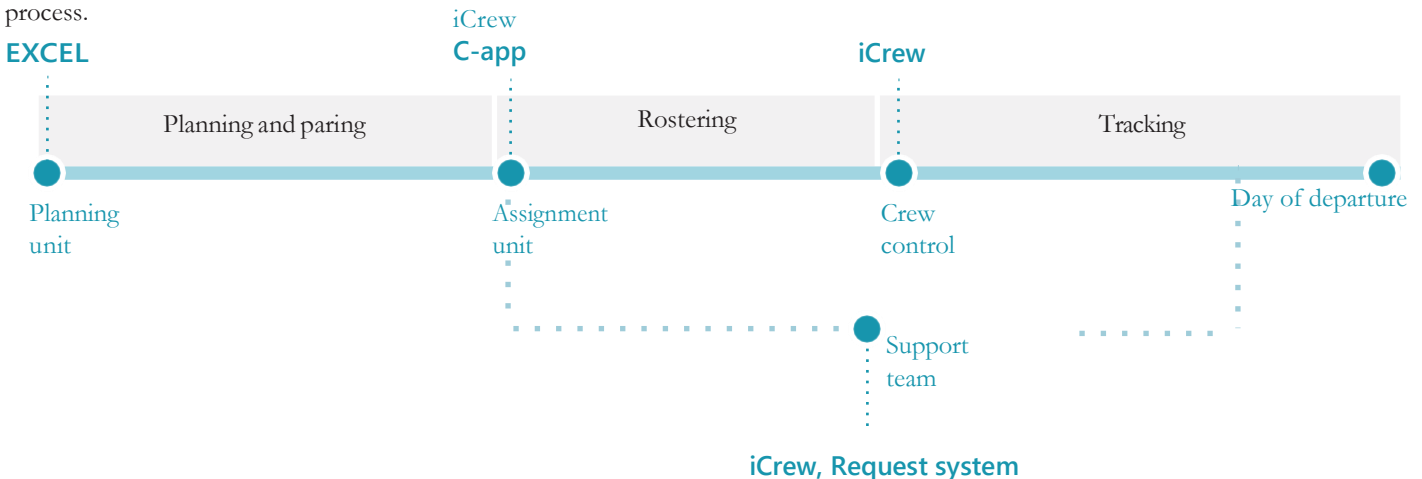


Figure 8. Roster process in FlyCo

C-app: FOR ROSTERING

C-app

C-app is a self-calculating and evaluating computer program. It is based on the regulations and rules from FlyCo which build year by year. C-app also takes the crew requests from the request system to calculate and optimize the crew's roster. It is based on three facts: cost, operating performance and crew's request. The Assignment team is the main user of this application, who adjust the roster after the C-app runs to make sure the quality of the roster is ready to publish. Tips: C-app also has a pairing system that the Planning units uses for the pairing phase.



Figure 9. C-app's interface wireframe

iCREW: FOR TRACKING

iCrew

iCrew is a tracking and monitor system that is customized by FlyCo and shares a similar interface with C-app. iCrew allows the Inflight service staff to be able to manage the operation and monitor the roster in Week 2 and Week 1 before the departure. All the adjustments done by iCrew will be fed forward to C-app, and C-app will also update iCrew in the daily base.



23 ROSTER PROCESS IN FlyCo

Self-rostering and P&A rostering together compose the FlyCo roster process. This process is complicated; it involves multiple users, five different applications, and its period starts two months before the departure. During the research, I encountered the complications of this process. In this section, I will share my observations.

23.1 SELF-ROSTERING

For the crew, it is essential to have a grip on their roster, and FlyCo offers the chance to do self-rostering. In fact, it is not an easy job to balance your life and work. Self-rostering is a long-term task for the crew members. The Request system is the primary tool the crew has access to in order to change their roster. D-app and H-app are not used often, but they relate to annual leave.

SELF-ROSTERING WITH REGULATION IN THE REQUEST SYSTEM

The Request system allows the crew to plan the roster 6 weeks before departure. During week 6 and week 5, on the Wednesday*, Thursday and Friday, the crew can make a total of three requests, which include flight requests and other hard bid requests per day. On the next day, the Request system will update the evaluation of request (grant or not grant). And in the week 5, C-app will publish the week 4 and week 3 roster. In week 4 and 3, the crew can release their roster, and make non-flight requests, and C-app will sign the roster again based on their requests. In week 2 and week 1, the crew no longer has control of their roster; only the Crew Control can change the roster based on the day of operation.

* On Wednesday, the crew can only request flights that will depart on Monday, Tuesday, and Wednesday of the next week.

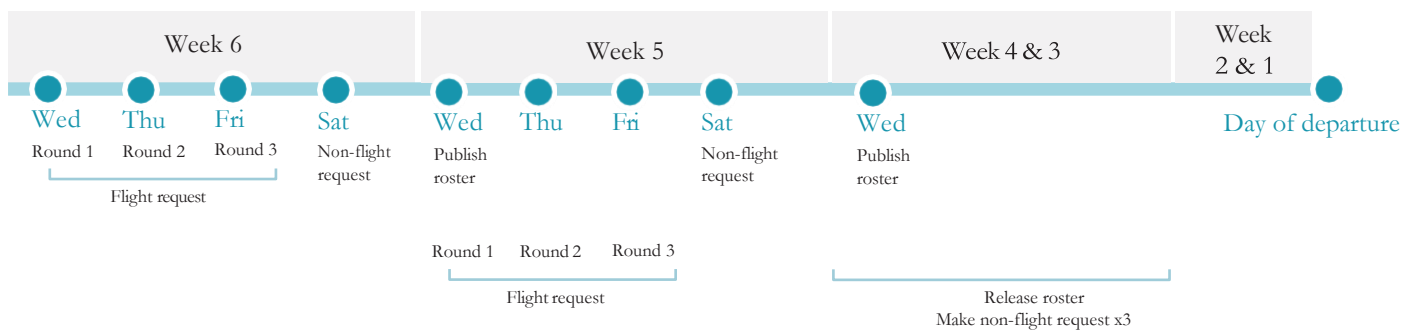


Figure 12. self-roster process

SELF-ROSTERING IN D-app AND HOLIDAY

Compared to the Request system, as I mentioned previously D-app and H-app are only open for specific periods of the year. Therefore, they are not the main tools for the crew to make the roster.

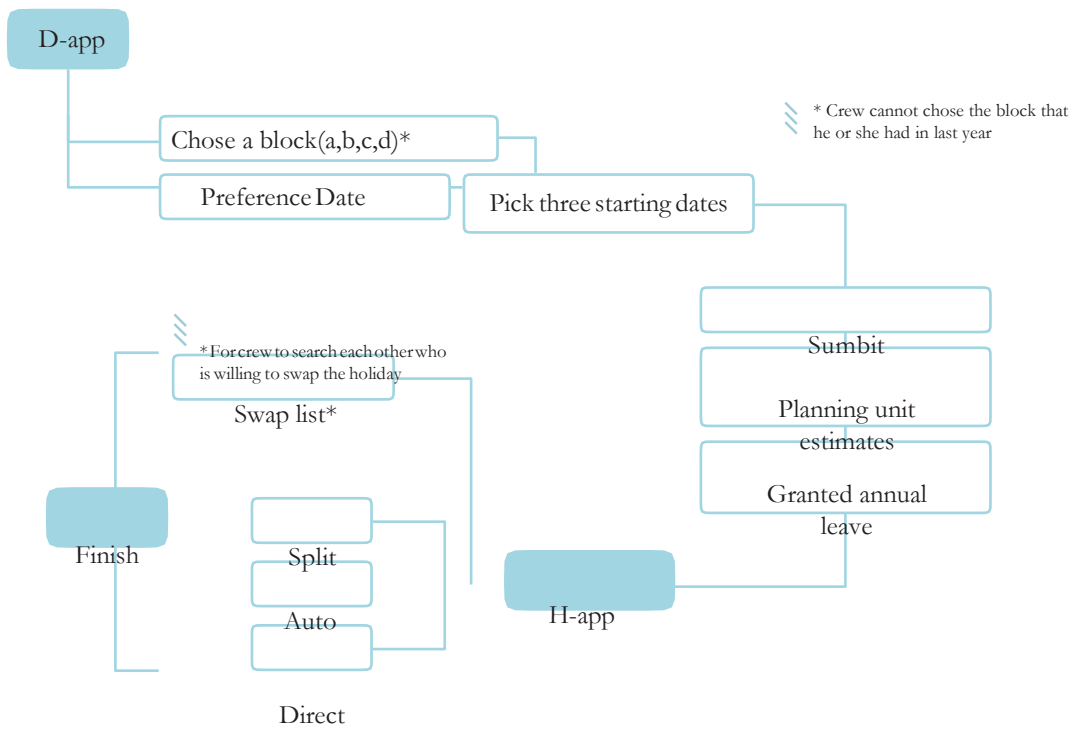
The figure on right shows the whole process to adjust the annual leave schedule.

23.2 CREW IN ROSTER PROCESS

The crew has time-limited self-rostering in each week, and the ways to engage with the roster process are diverse. The crew has the most power to change their roster through the three applications. In the other paths in the process, they can ask questions and report the situation, but no longer have access to change the roster. The P&A will estimate the situation and decide whether to make the change or not. During the interview, I noticed self-rostering is the very diverse system. Sometimes, the crew prefers to contact the people they know, rather than with the right people to ask.

24 SUMMARY

- **Back-end systems:** operating on the timeline toward the day of departure, with different supply. And it has gap and delay between systems, and currently, the P&A fulfill the gap by manual work.
- **Front-end systems:** there are no links between front-end applications. Each application links to a different back end system. However, all the data will go back to C-app for updating and optimization. This creates a delay between front-end applications. I am impressed by P&A staff. They are an experienced and highly efficient group, and everyone is expert at their job. Facing the technology end phase of applications, they carry out intensive manual work to balance the roster between cost, efficiency and crew's needs, which should be



done by applications. Notably, when the back-end applications show instability and limited development, the P&A staff manage the situation and make the roster work for the crew. The communication gap between the applications is the main cause of the current situation. In other words, the current roster system is not a seamless and low torrent system. Instead, it needs people to maintain the functionality and operation. Moreover, there are too many applications for the crew to use, and they have different user flows and user interfaces. This creates difficulty for staff at the learning stage. The rostering process is a weekly process, in which crew can make their weekly requests to the system which satisfy their needs in their personal lives, but the limited time frame and complicated process make the system hard to grasp.





Chapter 3. USER RESEARCH

After the study of the current roster system, I started the user research with the main stakeholder: Crew. In this chapter, I will go through my research methodology and results from the research.

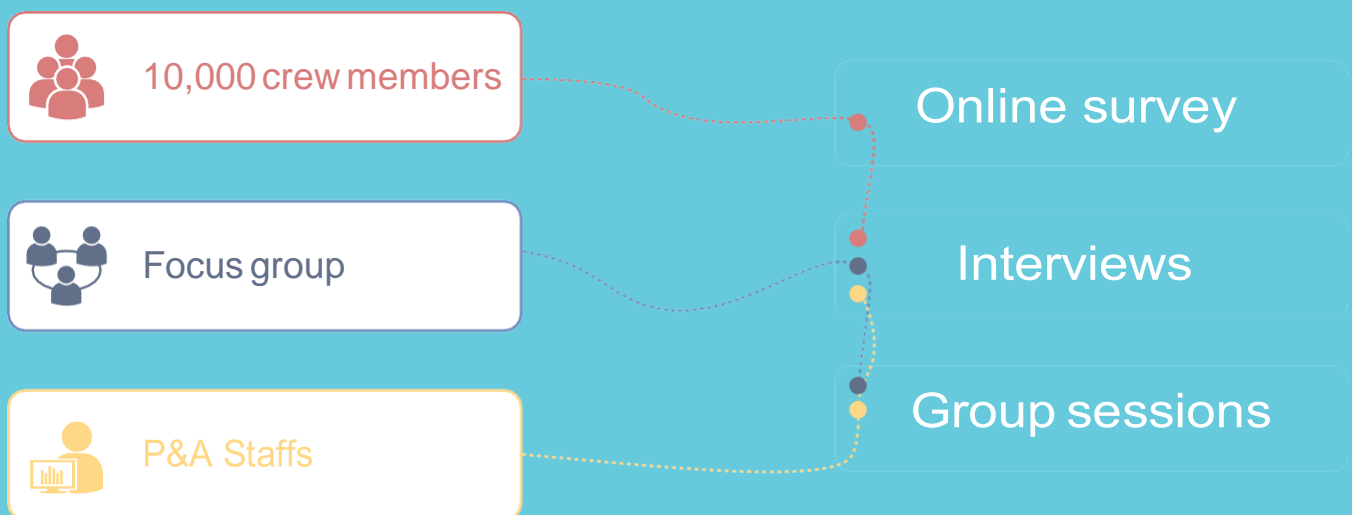
RESEARCH GOALS AND OBJECTIVES

The research goal of this project is to **understand the crew's needs and wants for the future crew roster system design (front end)**. To reach this research goal, there are several steps. First, I need to understand the current user experience and current system usage. By following the current situation, I can find out what is missing in the current system and the general needs and wants from the roster. Second, as I said previously, FlyCo cabin crew are the main users of the rostering system, and I need to define who they are by creating personas. Finally, by analysing the results of the research, I can determine the design criteria of the future rostering system with regard to the needs and wants of crews.

RESEARCH PHASES AND RESEARCH METHODS

In the research phase, I separated the research targets into three groups: Crew, focus group, and P&A staff. For each group, I have different research methods.

- Crew refers to all the members that I cannot get detailed information for because of limited time and resources, so I mainly focused on an online survey which delivers an impression and thought about the system from the public. Meanwhile, I interview 15 crew members about their personal thoughts and experience to gain a clear image of the current situation.
- The focus group is ten crew members who attended my research group session on this project. The different methods we used in the research sessions allow me to dig deeper into the topic.
- P&A staff: they are experienced experts in crew rostering. They have the full picture of the current situation both back and front end, and of any problems in the current system that crew is facing. They provide a different and third person aspect of the view of crew rostering.



3.1 RESEARCH METHODS

During the research period, I mainly apply three methods to explore: Online survey, interviews, and group session. Each research result corresponds to other work very well, and each method has its own focus.



3.1.1 ONLINE SURVEY: VERDERE ONTWIKKELING ROOSTERSYSTEMEN

The online survey “Verdere ontwikkeling roostersystemen” is a co-work survey between carried out by SPD student Yingyi Lai and me. It sends the invitation via email, and it stays open for one month. In the end, it has a total of 2030 replies from crew members. This is a very positive outcome from which I have a quantity of data from the crew about the current rostering situation. There are five parts to this survey.

- Sap data of crew member, to know who is answering the survey, the questions are:
 - What your function on board?
 - What is your current contract percentage?
 - How old are you?
 - How long have you worked at FlyCo?
- Emotion with roster
 - In this section, I want to know the crew satisfaction with the whole FlyCo roster experience, and the survey provides an opinion scale from 1-5 for the crew to share their emotions and feelings about current rostering. The statements I give to the crew are:
 - My roster determines my personal agenda
 - I have an influence on my roster
 - I am satisfied with the possibilities of getting a day or a few days off in the long-term
 - I am satisfied with the possibilities to have a day or a few days off in the short team (1-4 weeks)
- Roster service
 - In this section, I want to know the current support and service form FlyCo to the crew.
 - There are three multiple choice questions:
 - How many programs and apps do you use for your work at FlyCo?
 - Which of the following apps and programs do you use for your roster and roster-related questions?
 - What do you do if you have a problem with your roster? (only choose one)
- Functions (The functionality of Request system) The goal of these sections is to gain an impression of function usability in the current system, and I give two open questions:
 - Which function in the Request system, D-app or H-app, do you prefer?
 - Which function in the Request system, D-app or H-app, do you never or hardly ever use?
- Wish from the crew
 - I want to have some inputs about their needs and wants, which the current system does not provide. The open question is:
 - If you could change something about the current rostering system, what would that be?

3.1.2 INTERVIEWS

INTERVIEW WITH CREWS

I interview the crew. The main goal of this interview is to get an impression about the advantages and disadvantages of current rostering from the crew perspective. Therefore, I focus on their experience and feelings. I interviewed 15 crew members in total.

To interview more people, I made two types of interview:

- 10-minute interview that focused on the crew experience of current apps and system (advantages and disadvantages). As a small activity, I ask the crew to pick the Top 3 functions that they use the most and to pick three functions that they do not use.
- 15 minute or longer interview, which is an extended interview that adds a task asking the crew to make a journey (See the figure 14.) using their rostering (try to find out where, when, and at what moment events happen with the roster system).

INTERVIEW WITH SUPPORT TEAM AND M.C.C.



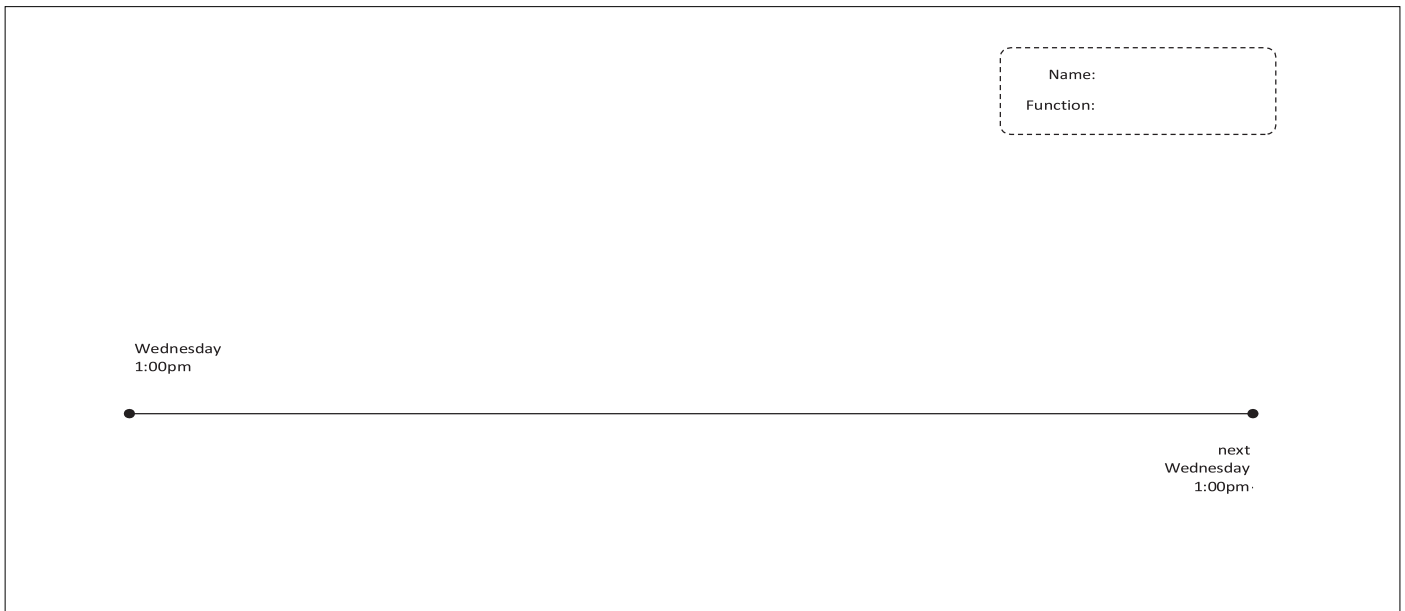


Figure 14. blank weekly roster journey map (for interview)

I also include the P&A Support team and Crew manager (M.C.C., the crew’s personal manager) as my interviewees in the user research phase. I interviewed five P&A Support team’s staff and four M.C.C.s. The P&A Support team knows what kind of system the crew use, and what kind of problems they may have on the roster. So, they know the crew’s roster behavior. The M.C.C.s know their crew members well in person. They understand the crew’s personal lives, and the effect that brings to the roster, and can see the story from the crew’s perspective. These interviews give me a more in-depth knowledge of who is the crew and help me to build the brief persona of crew roster behavior.

3.13 GROUP SESSIONS

GROUP SESSION WITH P&A SUPPORT TEAM

Fifteen Support team staff joined the session. Some of them work as Neven at FlyCo.

The P&A support team are the most experienced people who know what kind of issues or problems that the crew are facing and have knowledge of both the back and the front-end systems. Having the group session with them gives me an entire image of current crew experience. With the time limited and to prepare the P&A Support team staff, they have been given a small sensitizing activity three days before the group session. After the small activity, I held a one-hour group session with them.

1. Sensitizing activity: The activity is simple and straightforward. I ask the staff to write the Top 3 roster problems they have or the most impressive crew they have daily. It took around 5 minutes daily. In the end, there were a total of 45 problems that the support team shared. The figure 15 below shows the setting of this activity.
2. In the group session, I also use the Affinity map method, because I want to align the session results with crew’s group session. So, in this session, the question I asked was “what is your vision of future rostering?” I mainly explored their thinking about the future rostering system.



Figure 15. Sensitizing activity setting



Figure 16. Group session with P&A support team

GROUP SESSION WITH FOCUS GROUP

The SPD student and I together hosted the group sessions together. The participants of the focus group (10 crew members) joined the two group sessions. Each session took around two hours and had different topics and goals. The current roster system group session is the first session, and its goal is to find out the current user experience of rostering, the advantages and disadvantages. Another is the future rostering system session, in which I want to identify the crew's needs and wants, and their vision or imagination of the ideal future roster system.

1. Current roster system group session

- Journey maps: The goal of these maps is to find out the pain points in the current experience and why or what cause them. Based on the interviews and introduction that I did in background research, I illustrate two journey maps: Yearly rostering experience, and Weekly rostering experience. In each journey map, we ask the crew to rate their emotion in each period on the fun scale and share their expertise. Moreover, in the weekly rostering experience map, the participants go through all possible actions that they took during the weekly rostering process and rated their mood on a fun scale and mark the applications they used or any unit that they can get help with. From this map, I want to learn which part of the current rostering did not fulfill the crew's needs and wants. The whole section took half an hour.
- Affinity Map: This method combines brainstorming and card sorting, to get a clear picture of participant's opinions of the current system. It starts with asking participants a question, and in this case, we ask: "what do you think about the current roster system?" The participants begin to brainstorm about the answer, and after that, the crews work as one group to categorize their ideas into groups and name the groups. It is a great section for crews to share their thoughts both on the personal level and the group level. The whole section took one hour.

2. Future roster system group session

- Affinity Map. As I stated above, this combining method will help us to know the crew's thinking about the future roster system. And the question we ask is "What are your desires of future rostering?"
- Make a World is a creative section I want to have for later for the user interface design. In this section, we ask the crews to create a future (ideal) world of the roster using any formats that they feel comfortable with (drawing, writing, etc.), to help them to explain the ideas that might meet their needs but that are difficult to express though telling. So, in this section, there is a vision of the future system that helps me to ideate the future rostering system.



Figure 17. Group session with focus groups

3.2 RESULTS

3.2.1 SURVEY RESULTS

The following infographic poster (not included in report) presents the results from the online survey.

- Emotion with the roster: Most crews think the roster determines his or her personal life (4.5/5), and they think they have an influence on their roster (3.5/5). But for the long-term and short-term rostering certainty, the results are low as 2.9 and 2.2 out of 5, which shows the crew does not feel they have the promised schedule of his or her rostering in both long-term and short-term.
- Roster service: The majority of crew use 4-6 different applications which are related to their work, and 22.2% of crew even use 7-9 applications. The crew has various channels to arrange their roster, and at the same time they have multi-channels to get help when they have a roster-related problem.
- Functions (The functionality of Request system): The Flight request is the main function that crew use because it is more guaranteed function than others. And the Non-flight request, holiday (swap & split) and flight request are functions that the crew did not use.
- Wishes: The crew most wants long-term certainty, short-term flexibility, and access to information.

3.2.2 INTERVIEW RESULTS

THE NEEDS AND WANTS ARE DIFFERENT

The result of pick three functions (use most and do not use at all) from an interview with crew surprises me. The Top 3 requests they use are diverse. The main factor which influences the crew to use the function is their personal life, and it shows they have different need and wants. In other words, they have different needs and wants from their lives to base their demands on the system's functions. Moreover, the functions they do not use are different. The reason that they do not use the functions are: 1. The crew does not know the function exists, or they don't know how to use it, or 2. The crew knows the function, but they don't trust these functions* to get the roster they want.

≡* The function references here are mainly a NON-flight request.



Figure 18. interview Feedbacks: Top 3 functions crew used

VARIOUS WAYS TO MANAGE THE ROSTERING

During the interview with the crew and FlyCo ground staff, I found out there is no normative procedure to use the current rostering system. Each crew member learns from different channels, and some functions they learn from each other. And sometimes, they learn through tips from P&A support and so on. Their needs and wants are different, and they use the system differently.



THE MAJORITY GROUP IS SATISFIED WITH THE CURRENT SYSTEM

“The current system works just fine, it did what I am asking.” (100% 1 stripe, 2018)

“You need to spend some time to learn it, but the functions are all there.” (80% 2 stripe, 2018)

The crew is satisfied with current system’s functionality. They can find out a way to manage their roster, and with time and experience, they become better at using the system.

DIVERSE OPINION ON THE CURRENT SYSTEM (MAINLY RELATES THE REQUEST SYSTEM):

A complex system to use vs an effective system to use vs an easy system to use

- A complex system to use: Some crews are struggling with the roster system’s applications, processes, and regulations, etc. They lack information about how to operate the rostering system and about its limitations.
- An effective system to use: the crew who have this kind of opinion have good insight and knowledge about how the rostering system as a whole and the individual processes work. They know how to use the system to get their needs and wants.
- An easy system to use: most crew who have this kind of opinion know how to simplify the system usage and can use the functions they know without exploring other functionality. Current rostering process relies on manual work (in P&A)

The four units in P&A still rely on tons of manual work to maintain the quality of the roster. This applies especially to the Support team, who the crew can contact the support via email or phone, and can also just visit the support team desk.

“In the busy time, we can get 1000 emails and over 100 phone calls per day.” (P&A Support team staff, 2018)

With this volume of email and phone calls, the Support team is overwhelmed. Also, some of the crew cannot get their help. Moreover, during the interview, the staff reported that crew questions are repeated a lot.

3.2.3 GROUP SESSIONS RESULTS

GROUP SESSION WITH P&A SUPPORT TEAM

- **Gap between online and offline**

The support team collected a total of 45 requests in the Sensitizing activity, and I categorized and counted them, as seen in the figure 19. The most common question is about Flight Safety. The crew can make the flight safety request through the Request system, but the Request system only shows the notification when the crew opens the website. Sometimes, therefore, they forget to make requests, and then C-app will sign the day for them, but most times the date is not convenient for the crew.

- **Lacking knowledge of current system**

During the group session, this was a clear opinion from P&A support: most of the questions that the crew asks the Support team they could answer themselves through the system. But the crew did not fully understand how to use the system. Also, the lack of clarity in the regulations and lack of transparency of the system, meant the crew could not figure out the problem. Also, the sensitizing activity shows that the second major category is the System problems. This does not refer to the technical difficulty of the system, but to the fact that the crew did not know how to use the Request system, and they think the system has some problem with it.

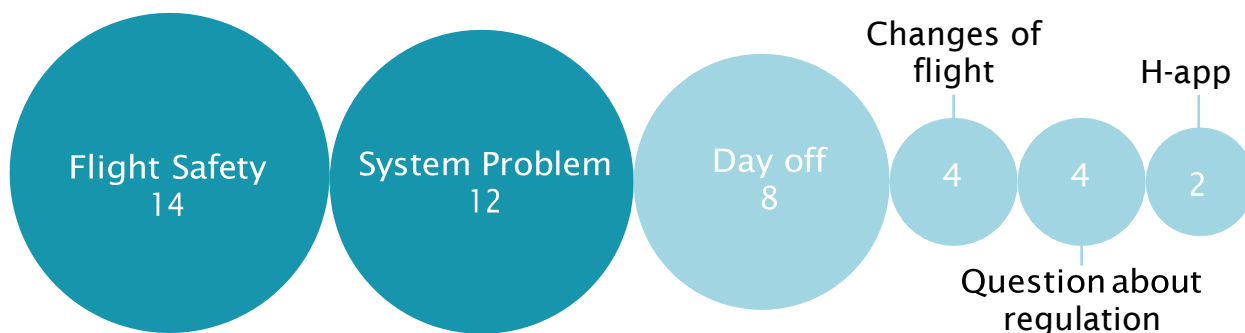


Figure 19. 45 roster question that P&A collected from crews

- **A vision of future design**

During the group session, I asked them to plan the Affinity map with the question: “what is your vision of future rostering?” The result (vision) of this activity precisely points out the flaw of the current rostering system. And I summarize their vision in one sentence are: A Real-time application which allows the crew to have a more extended planning period and more flexibility of rostering with better flight picking, and fixed preference setting. Most ideas are based on how to resolve the current rostering problems. It is a good session for me to start thinking about the design criteria.

GROUP SESSION WITH FOCUS GROUP

1. Current roster system group session

- Journey map

To help me understand crew rostering experience, we asked them to rate their mood in two journey maps, and the following two figures show the results. Each blue dot represents one participant.

Yearly rostering experience Map(Figure 20), In this map, I list out all the goals (nine in total) that the crew has during the year from planning annual leaves to dealing with urgent situations in the two weeks before departure.

There are five findings I want to share(the finding's number matches the figure's number):

- The problem we found in Plan holidays is there is no notification in the Request system. It sends by email. The crews forget to make their preference about their holiday. Also, D-app and H-app only open for short periods and sometimes the crew are too late to adjust their holidays.
- In the Reserve block, most people are happy with current situation. But with the FlyCo regulations, the reserve block makes the part-time crew
- Make requests period; all the participants are happy with what FlyCo offers today. Most crew also think the planning roster should be earlier; since the current planning is not early enough to plan personal life.
- Inform new roster (Week 4 to 3 before the departure); this has the lowest emotion in the whole crew experience. The pain point here is about releasing the roster. The crews think it is too long to wait because after release of the roster it will take one week to give the crew a new roster. And in this period, the crew cannot make a flight request, so there is no 100% certainty what kind of roster the crew will have. To the crew, this feels like gambling. Sometimes, they even feel as if the new roster is worse.
- When crew report ill, the two weeks roster will countermand. Therefore, in the Report ill or Report better phase, when the crew does not want their roster gone, this may result in sick crew on board.

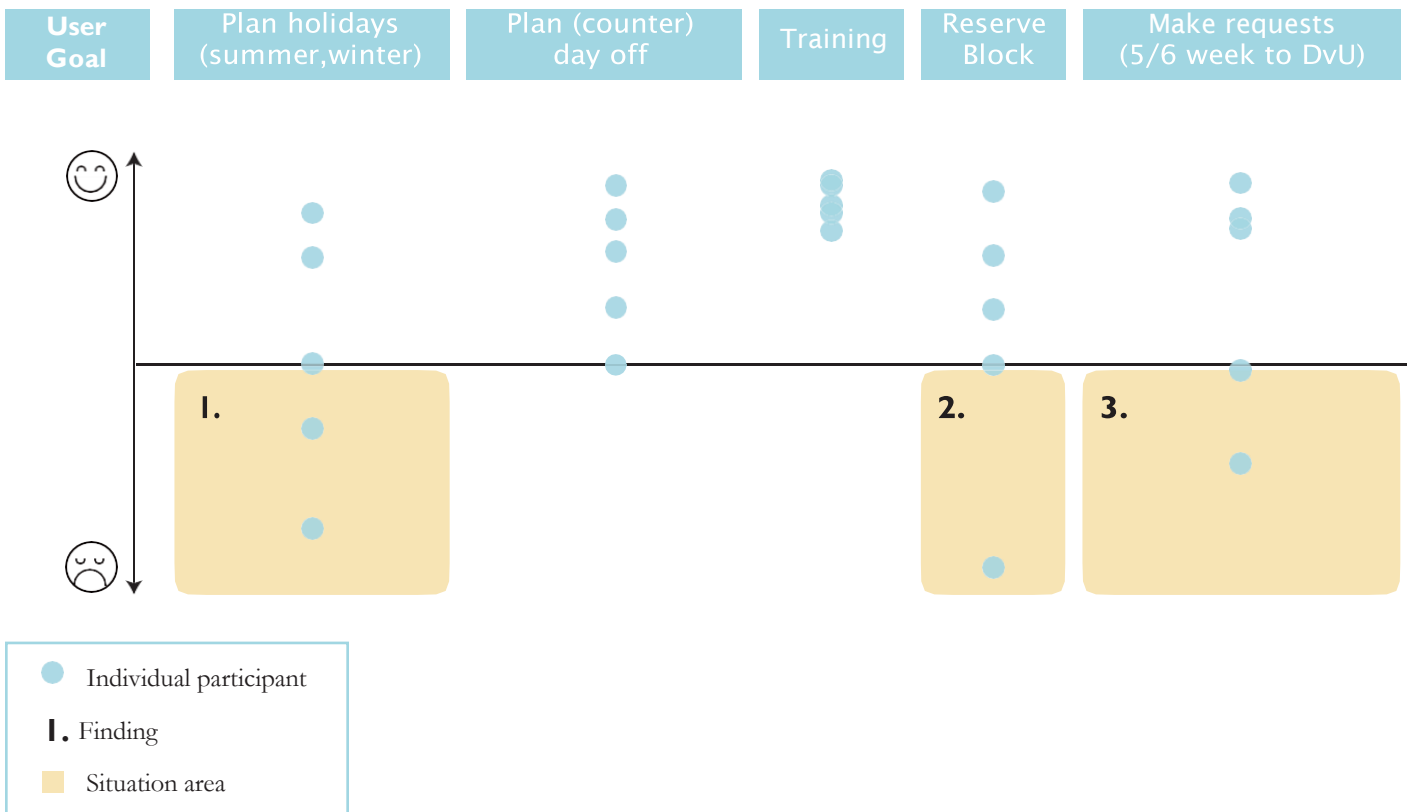


Figure 20. Yearly rostering experience Map

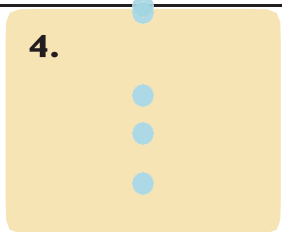
Inform new roster
(Week 3/4 publish)

Earn
extra

Report
ill or better

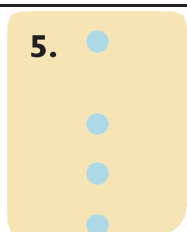
Deal with urgent situations
(1/2 week to DvU)

4.



A yellow rounded rectangle containing four blue dots arranged vertically. The top dot is positioned above a horizontal black line, while the other three dots are below it.

5.



A yellow rounded rectangle containing four blue dots arranged vertically. The top dot is positioned above a horizontal black line, while the other three dots are below it.



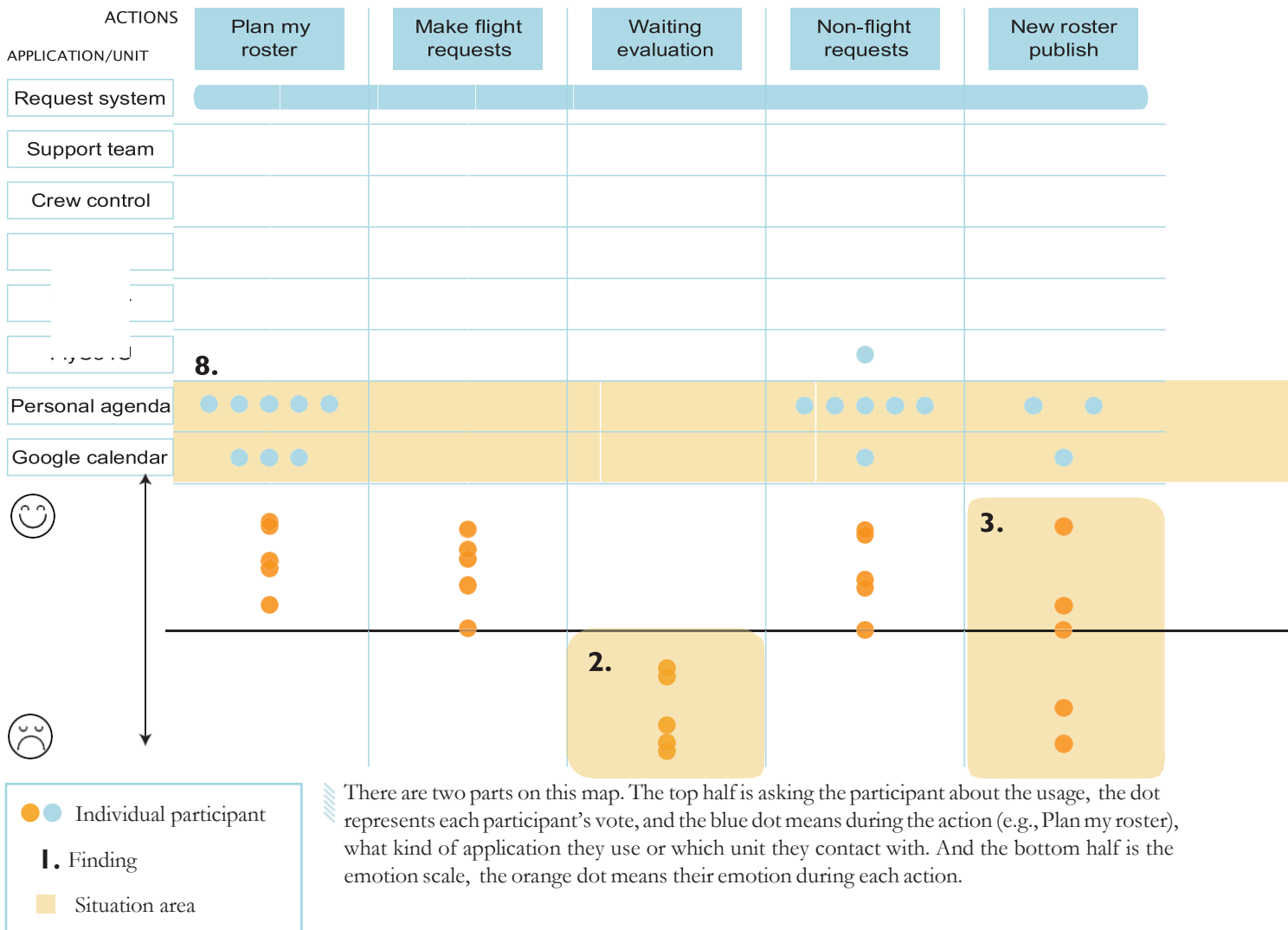
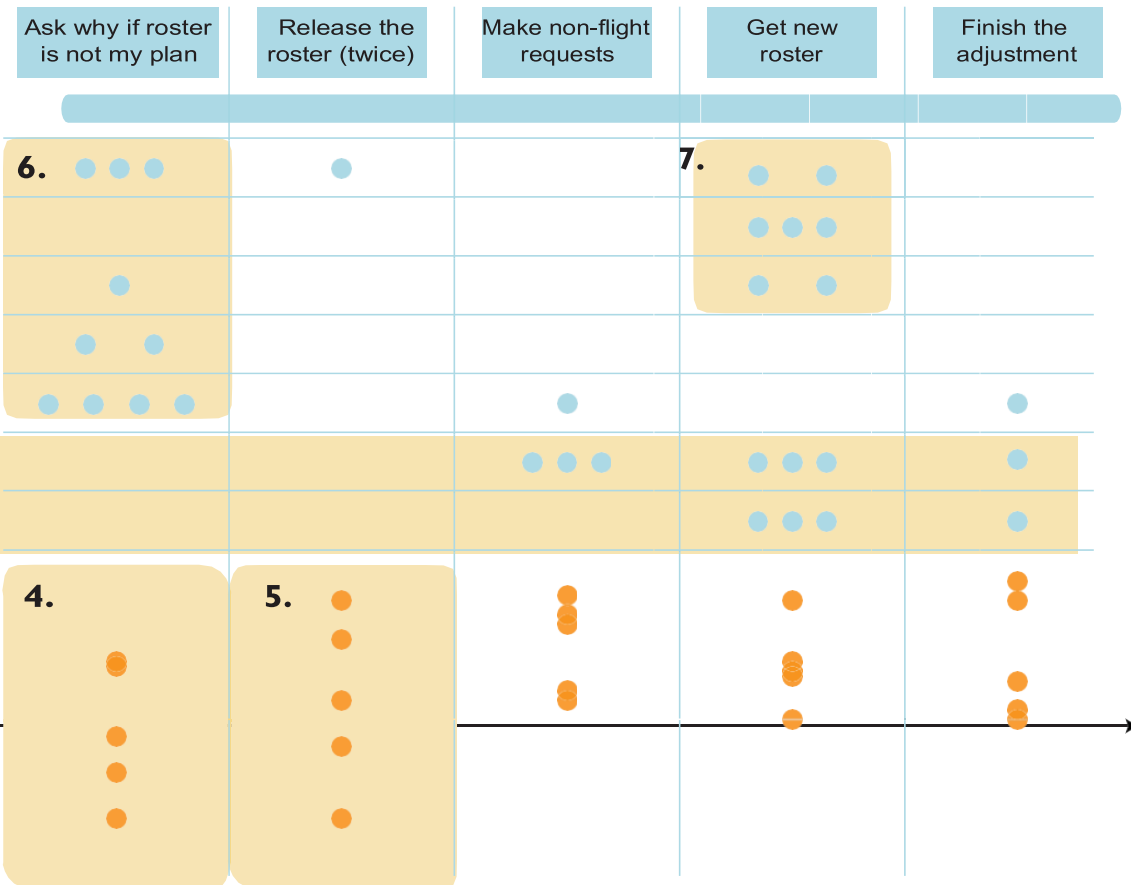


Figure 21. Weekly rostering experience Map

Weekly rostering experience Map.

In this map, I list out the weekly roster process of the crew and the FlyCo application and other tools that crew used. The results are presented in Figure 21. Its findings are:

1. From the map, all participants use the Request system. This shows the Request system is the main application to use; it is used in all the actions in the roster process;
2. In Waiting for evaluation action, all the participants show the negative mood. The reason is it takes too long, and the same situation happened in the Yearly rostering experience map. Also, it is a repeating and disconnected period. There are three evaluation rounds with different regulations in rows. (e.g., Crew submits request round 1, system evaluates request 1; crew submit request round 2, system evaluates request 2,...)
3. In the New roster publish phase, participants show different emotions. The reason is that having a good or bad roster affects the crew's mood. Therefore, the roster is very significant to the crew.
4. In Ask why if the roster is not my plan, the crew's emotion depends on whether the crew can get a clear and effective answer to the question or resolve the problem. This reveals the unclear supporting in the current situation.
5. In Release the roster, on the one hand, the crew is happy that they can release the roster; but on the other hand, it feels like gambling.
6. In Ask why if the roster is not my plan, there are multi-channels to get help. During the session, the participants give two reasons: the crew did not trust the Support team entirely, and they believe other channels can offer the things that Support team could not.
7. The Get new roster is almost the end of the roster process. The map shows the crew still asks for help here by using different channels. This is because sometimes the crew are still not happy with their roster, and are trying to find a way to get what they want.
8. The Personal agenda and Google Calendar are used in the whole roster process. The crew shows that they need an extra planning feature (Calendar) to support their rostering.



- Affinity map

In the last section of current roster experience, the crews were asked to do the Affinity map with the question: “What do you think about current roster system?” Through the activity, the crews share their experience of current rostering.

A summary of their opinions:

- The system is not easy to understand or use (e.g., Open Buddy function);
- Evaluation took too long;
- UI/UX of the website does not design well;
- Need longer planning period;

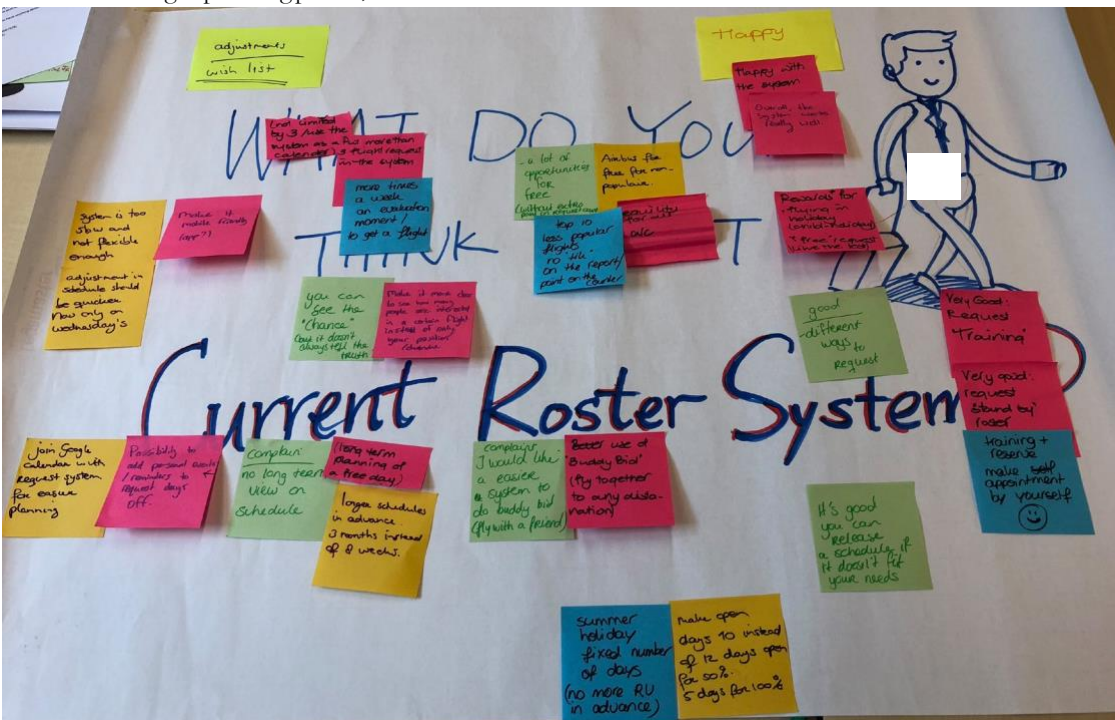


Figure 22. Affinity map of current system

2. Future roster system group session

In this section, the crew used their experience and imagination to think about future rostering in an ideal world. In this kind of context, the crew was freer to express their thinking, needs and wants.

- Affinity map

“What do you desire of future rostering?” is the question we ask the crew in this section. I want to know in the future context, what are the crew’s needs and wants. The vision the crew created will be used as a design reference. And the crew’s future views of rostering are:

- ! Fair system
- ! Better UI/UX design
- ! Longer roster period
- ! Flexibility in adjusting the roster
- ! Better information and contact on urgent situations
- ! Swap with others
- ! Make the roster social
- ! Have preference settings

Comparing all the affinity maps, I can see some points mentioned multiple times. This shows the crew and P&A groups both notice the needs and wants in the crew’s rostering process. I will use the insights from the sessions for transfer to my design criteria.

- Make a world

Make a world is a method that lets participants imagine the future and take action to create the first version of it. In this section, we asked the crew to create a future world of the roster by any forms that they feel comfortable with (drawing, writing, etc.), to help the crew to explain the ideas that might meet their needs but might be hard to express through telling or writing. I made a mind map based on their world. (not included)



Figure 23. Crew’s Mindmap of Make a World session

This is a very insightful section. In this mind map, there are two main parts: Roster for you and FlyCo as a community. In Roster for you, the crew wants to have more automatic roster experience by sharing personal data with the system, and a personalized roster based on their preference. And they want FlyCo as a community, which shows the crew thinks they need to be more social among the crew members. On one hand it could help them to self-roster, and on the other, it could help crew get to know each other.

3.3 PERSONA

“The purpose of working with personas is to be able to develop solutions, products and services based upon the needs and goals of your users.” (Dam & Siang, 2018)

During the interview with the crew, I noticed a problem immediately, which is that the crews have different roster behavior and personal characters from each other. So, there is no way to generalize all the crew but it is necessary treat them differently. The reason I chose the persona method is that it helps me to recognize the different groups with their personal needs, behaviors, and expectations. Especially in this FlyCo case, I am dealing with 10,000 cabin crews; I need the persona to help me to identify my target group. In another words, I want to use a persona to know who I should design for. To formulate and validate the personas, I ran different methods with different people. During the research, I align the persona with other research. Also, as I mentioned before, my user group is a huge number, so it is hard to know each one’s need and wants. Therefore, I apply the Persona method for narrowing down the focus and understanding my user group in this project.

3.3.1 FIRST IMPRESSION

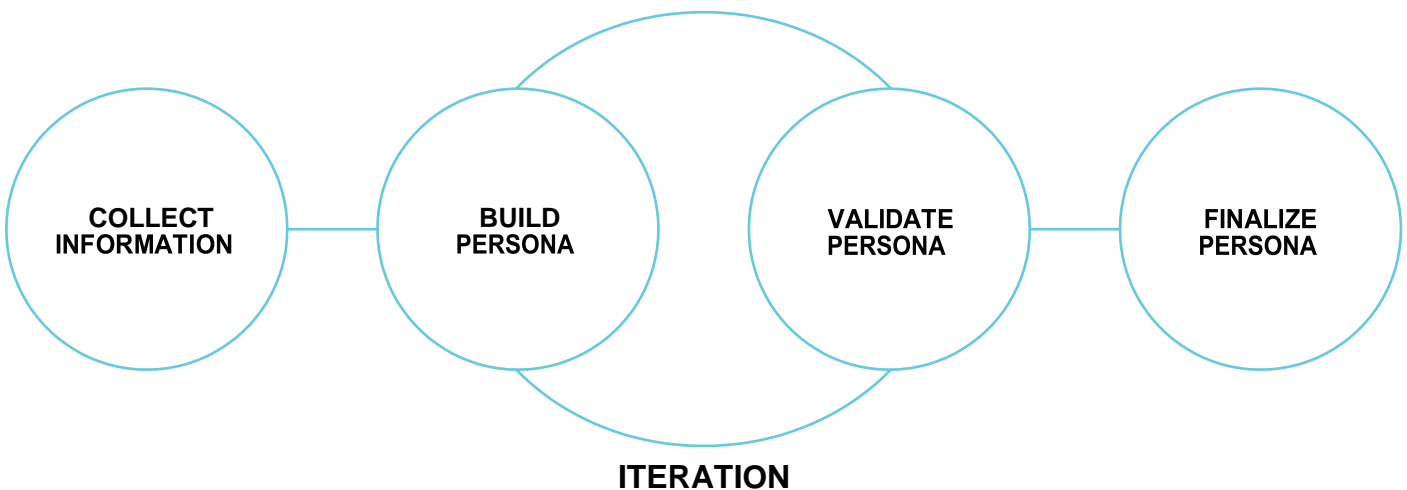
During the background research, I came up with a general impression which represents the majority crew member. Crew members, in general, have an observable kind of personality.. They are the group who stand out from the crowd. As a service profession, the cabin crew members show good manners and are good at communication. And they always dress in uniform, which earns people’s trust quickly. I categorized some general characteristics that I observed during the research and introduced by my interviewees.

personal characters:

- hospitable
- prefer face to face interaction
- have a lot of people skill
- does not have a fixed schedule
- always be prepared
- not good at computer behaviour with roster
- only know own personal situation
- want to balance their life with the roster
- make a request, wait for it, grant or not grant

3.3.2 CREW PERSONA: DREAMER, PLANNER, MIXED

To summarize the persona of 10,000 people is not an easy job. The personas were changed several times. First, I gathered the information from HR for SAP data to know the profile of crew, and their position and work contract in the FlyCo. Then, I came up with three types of persona, which I validated with crew members and ground staff (P&A and M.C.C.) via interview and group session. Through the long and continuing process, I finalized the crew persona into three types: Dreamer, Planner, Mixed.



PERSONA 1 PLANNER: THE BIGGEST GROUP IN THE CURRENT CABIN CREW EMPLOYEE.



The majority group of current cabin crew are experienced FlyCo crew members.

CHARACTERS:

- Most of them have settled down in their lives (e.g., have a family, are parents, take the cabin crew role as their life work),
- The functions they use most in the request system are
- Request Flight and Day off,
- Rarely use the non-flight request, only use the features they knew, and do not use other functions in the system,
- Most times, Planner has a rostering routine, if some exceptions happen in life. They may appear that they are not good with planning their roster (the reason to contact the support team). Planner only uses the functions they know. When they did not get the roster they want, they will either just quit and take what they have or call the support team to fix it.

NEED:

- Grab time off
- For the planner, the destination or the trip does not have the priority from their perspective. The planner does not care about they go, but their day off has a significant meaning to their personal life. Also, the online survey results verify this need. day off is more important than the destination
- Able to have a Fixed routine in life
- In another words, this type of crew needs to grab on their roster

GOAL:

- To make a good schedule (work & personal life balanced) every week
- Be certain about rostering
- For Planner, the personal life fits into roster



PERSONA 2 DREAMER: THE GROUP PEOPLE WILL BE THE MAJORITY GROUP IN THE FUTURE.



Dreamer

Most them are new to the job, and they feel excited about their job. This group represents the young generation as FlyCo cabin crew. And it is the group that will be continuing to grow.

CHARACTERS:

- They have not settled down in their life;
- They use request flight most, and other non-flight requests related to the destination; (They still feel excited about flying around the world)
- They care about where they go, and how long the trip is. But they do not care about when, such as not minding about working over the weekend;
- Most Dreamers will eventually become Planners

NEED:

- A better mobile application
As the young generation of FlyCo crew, they are well-trained in current technology. To be able to check the roster on their mobile device is a basic need.
- More information about rostering
Most dreamers are not experienced crew yet, so they lack knowledge about rostering, e.g., knowing about new/popular flights.

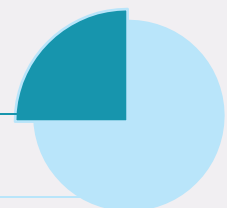
GOAL:

- To get good flights
- To be sure about their day off for a party with the friend

Personal life

Fits into

Roster



In fact, they show two types of behavior: Type A and Type B

PERSONA 3.1 MIXTED A: THE GROUP PEOPLE WHO ARE GOOD WITH CURRENT ROSTER SYSTEM.



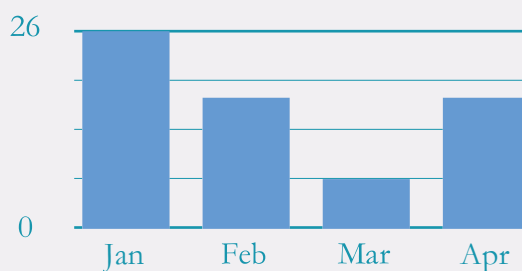
Mixed A

The crews use the system in the most lucrative way; this means they know the system and will spend time on it.

CHARACTERS:

- Understand how the roster system and its process works, and how to get what they want
- Plan things ahead
- Rarely call the support team
- Sometimes, they are dreamers who let C-app sign the roster for them, but in a certain period, like King's day, they become the Planner to make sure they have the holiday

Request counter example



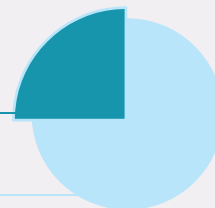
NEED:

- "Big picture" information
- Type A wants to have more operating information and roster insight to make a better plan
- Longer planning period
- Most of type A are good at planning. They want to have more extended roster periods to plan their personal lives
- An application which can edit both personal life and work

GOAL:

- To have a vacation on school holidays, King's day and other popular holidays
- Reduce the time they spend on planning their roster

At most times,
Personal life
Fits into
Roster



PERSONA 3.2 MIXED B: THE GROUP PEOPLE WHO ARE GOOD WITH CURRENT ROSTER SYSTEM.



Mixed B

This type of crew simplifies the system usage by sacrificing some chances and only using few functions in the system.

CHARACTERS:

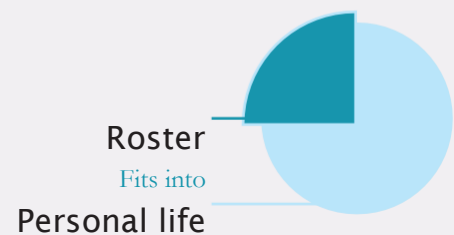
- Understand how the roster system and process works, and how to get what they want. For example, the crew sacrifices the chance to fly the popular flight (e.g., good destination, good flight cycle, etc.), to get the certainly fixed schedule.
- Plan things ahead
- Rarely call the support team
- Only use the Flight Request, and do not trust non-flight request
- Have high points in request counter (e.g., 26)
- Have the strongest control on their roster compared to other groups
- Do not care where they go, but the day off is important to them

NEED:

- More information
Crew want to have rostering information about the unpopular flights to make sure they get the day off
- Want to know the open flight information, to see other chances they could have

GOAL:

- To have ta day off on weekends
- To have a routine life



The three types of persona show the diversity of crew's needs and goals, and also how their personal lives and characters affect their rostering behaviors. It is a good opportunity to design a better front-end application which helps the P&A to steer the operation. However, this does not mean they all are my target group. The target group of this project will be defined in a later chapter.



3.4 ANALYSIS

In the analysis of User research, I will summarize my findings and results during the research period. To present the analysis, I come up with three directions: Application, Roster Process, and Crew with rostering.

3.4.1 APPLICATIONS

Request system, D-app and H-app build the front-end rostering system. Request system is the main tool for the crew to manage their roster. D-app is the web form for submitting annual leave preference. And H-app is the website for adjusting the annual leaves. Each application was designed with different interface styles.

COVERED FUNCTIONALITY BUT POOR USABILITY: REQUEST SYSTEM

During the analysis of request system, I made a system function flow chart (see figure 4 system flow of request system).

As you can see the flow, the website structure is not complicated; in fact, it is a simple and straightforward basic website. And all the functions (requests) crew need for rostering are covered on the website. However, during the interview with Crew and the units in P&A, the most frequently mentioned comment on this system is:

"It is a complex system (request system) to use." - A statement from both crew and P&A interview

Here are the reasons:

1. Self-learning the system

It is hard for the crew to begin with the Request system without a guide or manual to learn the system. During the interviews, I found out the most crew are self-learning the system by exploring the website individually and learning from their colleagues. This situation causes the crew to not fully understand the application and not use it correctly.

2. Does not use the system properly

Because of reason 1, the crew did not know all the features that the Request system provides. Most times, they use only the functions they were taught. The crew cannot plan the most beneficial roster for them because of that limitation. For example, some crews did not even know that the non-flight request (without costs request counter) can offer the same flight they use the flight request (costs request counter). The functionality of the website is covered, but the crew is not aware of all of it or how to use it.

3. Lack of Transparency causes lack of trust

The request system did not offer any statistics from the back end and share evaluation process with the crew. Therefore, the crew did not understand why he or she cannot get the flight they want when everything seems to qualify. At the beginning of this situation, the crew will contact the support team to ask why they cannot get the flight they want, but eventually, they begin to think the system is untruthful. "Something is going on in the back," I heard a lot during the interview with the crew. They believe there is secret priority behind the system that they do not know. In fact, when you can see the back end data, you will easily find out why. But there is no sharing of information between the back and front end, which causes this lack of trust in the system.

4. The system is not complicated, but the process and regulation make it complicated to use.

In most cases, the crew knows the regulations through their experience with the system. Also, due to the lack of transparency of the system, the crew did not know the regulations or operation process happening in back-end; this makes the process more complicated and mysterious to the crew. Without fully understanding the system, regulations, and processes, it is hard for the crew to make their roster without mistakes. And they feel they fail when they did not get granted their request after the long evaluation of the rostering process.

5. User interface design

The UI design of the Request system seems weird to me. Because when people talk about a scheduling website, it is natural to predict that it is a calendar format website. Instead, however, the request system offers a table format, and it is only able to be viewed as read only, without the edit function. It is not handy to use. This is why the crew always use the google calendar, or a personal calendar book, to schedule their rostering. And this adds an extra action to the process. Also, the analysis of the Request system shows there is no user flow or situation in the application. The interface did not guide the user to use the features, but just lists all the features on the menu bar.

REQUISITE FEATURE BUT REDUNDANT APPLICATIONS: D-app AND H-app

D-app and H-app, as previously introduced, are both applications for scheduling the annual leave for the crew. This is an important feature for all employees. However, it is not necessary to have two applications for the annual leave, since cabin crews already have many applications for work.

The processes of D-app and H-app are long and go through different units and applications. D-app is a web form, so there is no feedback after crew submit their preferences. During the interview, the crew told me that sometimes, they even forget to submit their



annual leave preference, because the reminder does not show on the Request system or any other application they use daily. It sends a reminder via email. And H-app is a website only for adjusting annual leave date. If they want to swap the holiday date with other crews, they need to go through the Swap list to find who can swap with them. And then, the crew can ask other crew through email to see if he or she wants to swap too. So, D-app and H-app both have too small and too limited functions to become individual applications. Therefore, these two applications could be a function of the future front-end rostering system.

3.42 ROSTER PROCESS

The rostering process is complicated in both back and front ends, so a simplified process is needed.

NO CORE IN THE PROCESS

Figure 25 shows the current roster environment in FlyCo from individual crew to the P&A unit. As you can see, the current rostering system involves multi-users and multi-applications. It makes the roster process more complicated. And each application has different suppliers and links to the separate database. And in this figure, you can tell there is no core in the process, which causes the inconsistency. Although all the information will feed forward to C-app, it takes time and has low fault tolerance.

LACK OF TRANSPARENCY

The request system is the only application where the crew can see the results of rostering. From the crew's perspective, they get the information from front-end applications. However, the rostering mainly happens in the back end, but the crew do not have access to the information. This situation causes misunderstandings and impairs self-rostering. This does not mean everything must be shared with the crew, but it would help to give them some insight into the rostering operation.

Email, phone, and visiting the desk at crew centre are the main contact methods between the crew and P&A Support. However, it is not efficient for P&A to help crew with their rostering on a daily basis

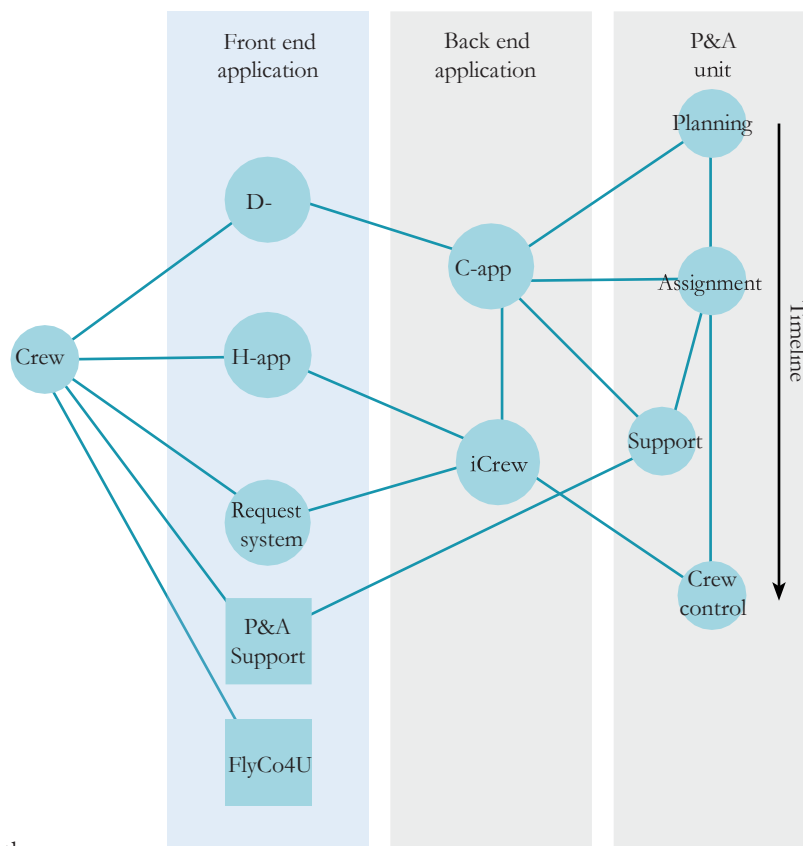


Figure 25. FlyCo current roster process model

because it relies on manual work, and it increases the workload for the P&A staff.

Moreover, this kind of model (figure 25) also causes misunderstandings and lack of information between the units inside the P&A. Different units use different applications, and the current backend rostering is timeline based, so some units have no idea about other units' operations. (e.g., Crew control has no idea about Support team's operation, and vice versa)

MULTI-CHANNEL SUPPORTING

In the survey and group session with the crew, I discovered that when the crew has a problem with their roster, they have many channels for help. The P&A support team should be the one that helps the crew with all their questions. During the interview with the crew, they observed:

“It also depends on who is your M.C.C. (crew manager) or who is on the shift of Crew control.” (100% Purser, 2018)

It is not a convenient situation for the Support team to manage. In the current case, the work duty of each unit still is not clear to the crew. And it also means there is a leak in this process, and the crew can find a sideways path to get their needs. But the positive result of the online survey is that the majority of crew chose contact with P&A as their top choice when they have a problem with a roster.

3.43 CREW WITH ROSTER

From the crew perspective, their journey and experience are quite different from the P&A staff's thoughts. So, in this section, I share my findings from the crew's perspective, their experience. First, a Journey map. Based on the results and conclusions, I made a current customer journey map. It shows the process that the crew goes through with rostering, their emotions, goals, touchpoints and pain points. From the crew perspective, their journey and experience are quite different from the P&A staff's thoughts.

PERSONAL LIFE + WORK SCHEDULE = ROSTER

From the P&A perspective, the roster only means the crew's work schedule, so everything is built around the practical requirements, and there is no space for the crew to plan their personal lives. However, from the Crew perspective, the roster is their lives, it includes and affects their personal lives. The online survey results are proof of this: when the survey asks a scale statement: “My roster determines my agenda”

from 1 to 5, the result is 4.5/5. This shows how important the roster is to the crew. And this unmatching cognition makes the roster harder for the crew. Putting the personal life and work schedule together is the purpose of the roster, but the general impression I get from the research is that they do not fit together well. The crew needs to put extra effort into making the roster fit into their plan. Moreover, there is another unmatching cognition related to rostering. The P&A staff think planning the roster is effortless work for the crew, or it does not take too much time. But in fact, most crews spend a lot of time on the roster to try to make a good plan to balance their personal life and work, and some crew even check the Request system every day to see if there are better chances that they can apply for.

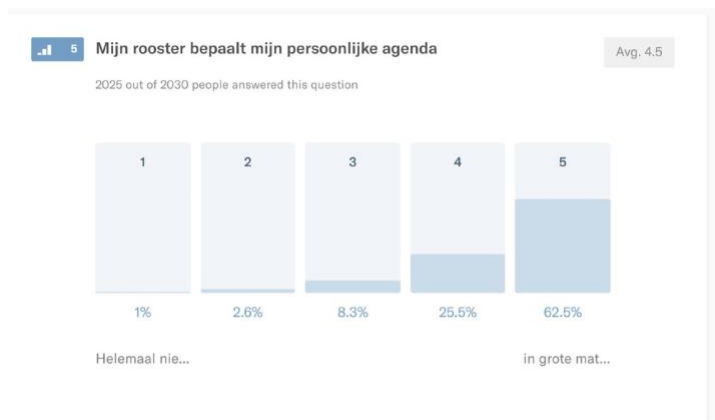


Figure 26. Survey results: question 5



Figure 27. Survey results: question 7



Figure 28. Survey results: question 8

LACK OF FLEXIBILITY

The current system is a functional-based process, and it is a step-by-step process. The good side of this kind of process is that it is easy to find out where and what is the problem, but it also means lack of flexibility. The lack of flexibility causes the long-term and short-term uncertainty of rostering. The online survey asked about the short-term flexibility, and as the data in figure 27 and 28 show, only 7.4% people can be sure about their long-term planning, and 3.2% people have a grip on their short-term planning. It also related to the current rostering process, and there are only a few ways to adjust the rostering.

ROSTER SYSTEM USER VS CREW

The front-end system (request system) provides all the functions that crew need, but without user flow in the design. As mentioned previously, it covers functionality, but is poor for usability. From the crew perspective, the situation is that when they make the roster (e.g., plan a day off for family's birthday), the website only shows all different requests. Without fully understanding what the request function can do, it is hard to make an effective and affordable request. I created a persona of people who are good with current roster system.

USER GROUP OF CURRENT SYSTEM: THE GROUP SHOULD HAVE BOTH SIDE KNOWLEDGE OF ROSTERING (CREW AND P&A)

He or she has a good idea of the operation process of FlyCo rostering and is good at searching for the information. There are five main characteristics that this persona should have.

Characteristics

1. good at planning things ahead; have a planned personal agenda; take time to plan things
2. Patient; try all the possibilities of rostering (e.g., which flight will fit), check the flights all the time
3. have a "big picture"; know which flight is unpopular, date of travel (required experience, and notice the details)
4. have confidence in their request; understand/ have knowledge of the regulation of roster
5. know what they are looking for; understand the function of roster systems

And compared to the Crew persona, there are gaps between them. We can even say they are opposite at a certain level. I made these two types of people's personas. It is apparent how these two groups are different from each other.

3.5 SUMMARY

Overall, the crew is happy with the current rostering system because it covers all the functions they need and they can get help when they need it. But there is plenty of room for improvement, especially if FlyCo wants the crew to do more self-rostering and reduce the workload of the P&A department.

I also made a ViP (Vision in Product) as a summary of my research.

Deconstruction

Past context:

- User: the majority crew has stable lifestyle, with emerging young generation crew group
- System: System is built time by time, basing on emerging need and want from the user. The systems are outdated, with limited develop, also in technology end phase.
- Process: weekly rostering with the fixed schedule, base on self-rostering and back-end rostering. But the current rostering relays on back-end roster.

Interaction level:

- Confused: It is confused system to use, because there is no guidance in the user interface, especially, for the new user. Also, the request evaluation result is lack of explanation.
- One-direction operation: The current system, there is the only online interaction between user and system; which means only when the user opens the system, there is interaction.
- Limited: The interaction is limited, because the major user does not know or how to use the functions in the system. Also, the user needs an extra tool to make the interaction completed or finish the task
- Disconnected: In the current system, there is no real-time feedback, and the process is broken down into several blocks. However, the rostering is the daily action for the user, so it makes the roster interaction disconnected.
- Diverse: Each user has own method to use the system, and each system has individual interaction and different user flow.

old product (holiday, D-app, and Request system):

- Web-based system
- Easy on the eye (color, fonts), with standard website formate
- Diverse user interaction and user experience
- Time-limited and non-offline usage
- Poor usability (e.g., non-guiding interface, non-categorized functions)
- Redundant system: H-app and D-app
- Unstable

Designing

Future context:

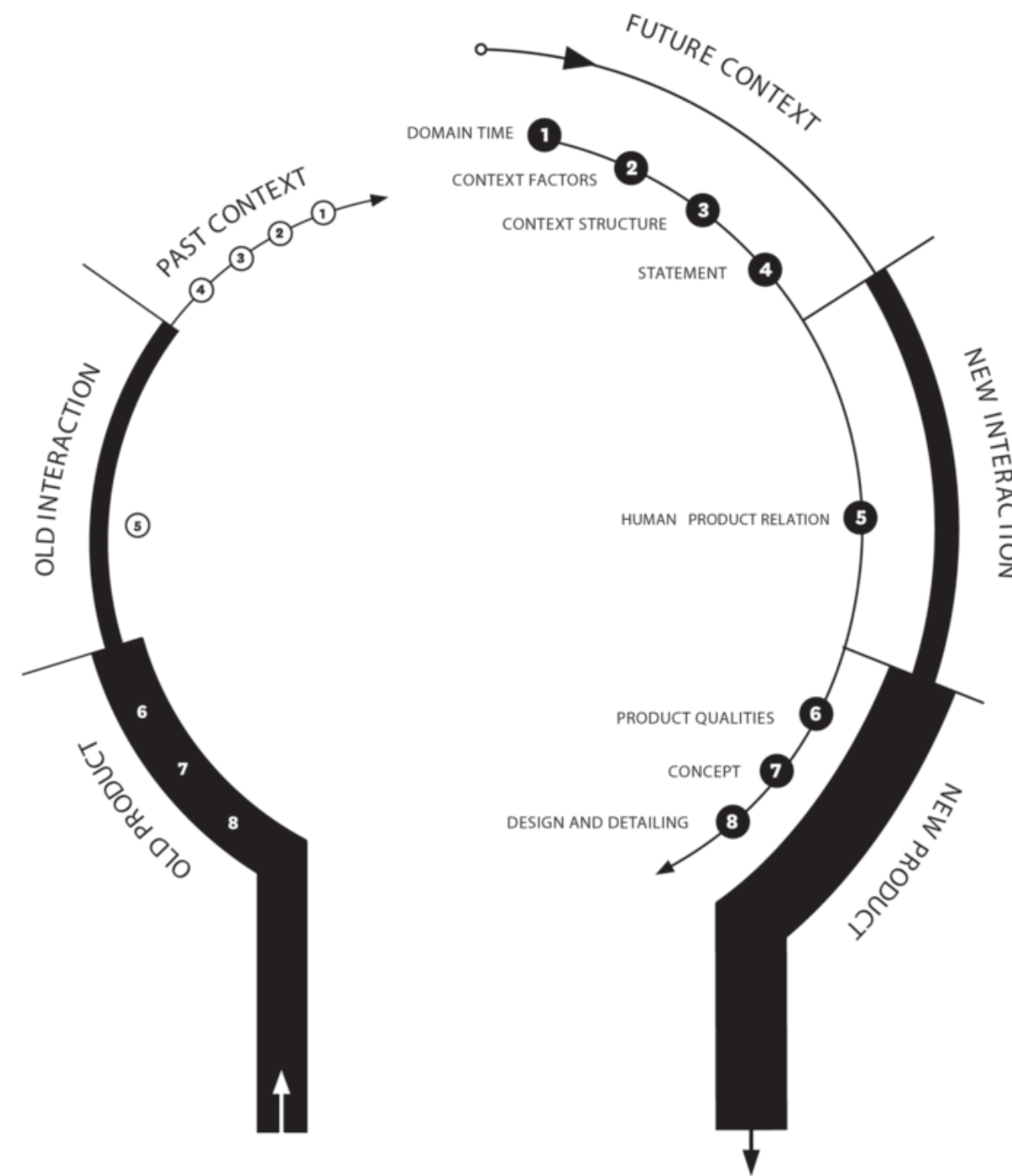
1. domain/ time: self-rostering, 10-15 years,
2. context factor:
 - User: most users are familiar and good with technology; they are more focus on the individual, instead of the group (Millennials: The Me Me Me Generation); but the job did not change too much, it still needs collaboration, teamwork.
 - System: one for all, unrestricted access and real-time feedback;
 - Process: Using the system when the user has the need. The user can access the system when they need. More transparency process.

Interaction level:

- Easy access: the user can reach system anytime and anywhere.
- Unify: Use only one system to plan roster, a combination of personal life and work
- Feedback: the feedback should be real-time and continued
- Predictability: the user should know what they will get by using the system
- Affordance: the system guides user how to use the system, and easy to learn

New product quality:

- one interface;
- personalization;
- real-time assessment and online & offline;
- suggestion;
- transparency;
- social element.



VISION IN PRODUCT

Chapter 4.

DESIGN FOCUS: FROM RESEARCH TO DESIGN

The project's design focus will be shared in this chapter. It consists of three parts: Design Criteria, Design goal, and Target groups. Design Criteria are based on the conclusion of the previous research which guides me in the future UI concept design. As you know, the Interaction design is goal-driven. The user will interact with the interface to accomplish the goal. So, the design goal is what I am aiming at with the project. Last, to archive the design goal, I need to know who I am designing for, so in this chapter, I will identify my target group.

4.1 DESIGN CRITERIA

Design Criteria are used in the transition phase from the research findings into the design guidelines; it frames the design concept and is also the starting point as ideation. It can be used to evaluate the future UI design. Design Criteria has been used as the guideline for UI concept design in this project.

1. One app for all (uniformity and mobility)

“There are so many logins,” (crew, Group session, 2018)

one crew states in the Focus group session. Indeed, in the current situation, 62.3% crew use 4-6 applications at work, and 22.4% crew use 7-9 applications. For the crew roster, three different applications link to separate back-end applications and departments and crew can search one FAQ website for information about the roster. A unified platform is needed. It will be easier to use and will manage the rostering with one front-end application. Also, it will help the P&A department to provide updated and correct information instantly. In the current situation, with many front-end applications (which link different back-end information), sometimes crew get confused by the different information on one parameter only because some back-end systems have not yet updated the information. However, correct and updated information is essential for rostering. Therefore, for the future crew roster system, I want to design one application for the crew to self-roster.

• A mobile app format

First of all, I found out there is no boundary between personal life and work for the crew. The flexible roster schedule merges personal life and work. Therefore, it is necessary to have an individual space (app) to balance the work and life, instead of using multi-applications for the same purpose. Secondly, the working tools for the crew are the iPad and the smartphone: they are mobile devices. Therefore, an app in their mobile device will make it easier for the crew to access and manage their roster. Thirdly, the website format does not suit the mobile device's user behavior. Although there is an alternative website, it cannot compare with the usability of the app usability in a mobile device. Moreover, one app would reflect a clear principle: Everything relates to the roster, and I can find everything here.

2. Access the information anytime anywhere (Online and offline usage)

In today's situation, there is no offline access to the rostering information, and the crew has to log in to the Request system website every time they want to check their roster. During the interview and group session with the crew, I noticed crew take screenshots of the roster in the request system, or write down information on their personal agenda, or export the roster to the google calendar. The crew create their own way to access the information during the offline period, which shows an offline roster is needed. Because the roster combines the crew's personal life with their work schedule, it cannot work if the crew focuses on only one of them.

3. Real-time assessment to improve the user experience

During the interview and focus group session with the crews, they talked about one problem that they really dislike: the requests can fail because of some regulations. The real-time assessment could avoid this situation. So, the future system can provide a basic assessment based on the regulations and the probability. The basic assessment means checking the all the rules and regulations to establish whether the flight can be assigned to the crew schedule without considering the whole roster operation yet. In this way, the crew their requests failing because of particular regulations. And adding the real-time assessment (give immediate feedback and results), the user can avoid some mistakes, feel more grip on their roster and plan weekly request wiser.

4. Personalized Roster

From my Persona study, I found out how diverse the crew group can be, and how different their needs and wants can be. But this is not bad news for rostering. With clear demands from the crew, it will be easier to plan flights that satisfy everyone, which is a wish the crews expressed every time. To establish the crew's preferences, I want to design an application which enables the crew to provide their needs and wants, and these inputs can be the reference data for the back-end system to optimize rostering. For example, in the google map navigation setting, the user can choose how they want to be navigated. In the future application, the user shares their preference to the back-end roster system, and the system based on this information the system can assign a roster that fits people's preferences.

5. Transparency in rostering

As I mentioned previously, no transparency or limited transparency is the problem of the current situation, since because of it the crew do not trust the system and cannot self-roster satisfactorily.

• Transparency of evaluation process:

In the roster process map (from group session with crew), the “Waiting for the evaluation” shows the most negative experience for the crew in the whole roster process. The reason is the waiting time is too long, and they do not know what is happening in this roster process. Therefore, I want to “reveal” the process to the crew. For example, like the package “track and trace” system in shipping and delivery, the process will give the customer/user a brief indication of the current status. This will enable the user to feel they have a “Grip on their package.” I want to provide this kind of transparency to the crew.



- “Big picture” data of rostering:
To have this kind of data will be helpful for self-rostering. For example, in the future front-end system, it will be advantageous to share statistics about the day of operation. The crew can then choose the day and flight they have a better chance to apply for.
- The transparency of open flight:
If FlyCo wants the crew to have high-quality self-rostering, the system should allow the crew to see all the flights that are open for applying, which will enable self-rostering without limited options.

6. Suggestion for requesting flight

During the creative session, I noticed that the new crew especially had a hard time to find out which flight is suited for them. Therefore, the application could provide the flights that might particular crew based on their historical data or preference setting during the self-rostering. Also, this is a good way for the back-end roster system to promote flights that they want the crew to have for the day of operation.

7. Online crew community in roster supporting

In the Make a world section, I notice that to have high-quality self-rostering, it will be important for the crew to help each other. It can be difficult for the computer to assign the perfect flight to everyone, since it calculates based on data and lacks a human touch. It also is ineffective and limited if the Support team or other P&A units change for them. However, offering an online community to the crew will provide an efficient way of self-rostering with 10,000 crews who can swap their rostering and help each other. Meanwhile, this will reduce the workload for the Support team. Therefore, the future roster system should include the social element: community. Also, with more and more of the young generation joining the crew, it will be a natural thing for them to know each other online, get the How to make a request information before the departure, and help each other through the internet.

8. Affordance and guiding app interface

Analysing the flow of the request system, I found out there is no user flow design in the system; in another words, the request system interface does not guide users or help them to adjust the roster. So, to improve the usability of the rostering system, I want to design a system with user flow and situation in the next design cycle that will make the system user friendly. The information structure of the current system (function-based) will shift to a user flow-based information structure; in this way, the crew can find what they need quickly and correctly and enjoy a better user experience.

DESIGN GOAL

I want to design an application (for the future 10 years) that helps FlyCo crews to have **efficient self-rostering** with support, and to **balance** their work and personal life and **grip on** their roster.

4.2 TARGET GROUPS (PLANNER AND DREAMER)

The user group in this project is 10,000 FlyCo cabin crews. To have a focus on the design, I created crew personas (see Chapter 3.3 Persona). In the crew persona, there are three type people: Planner, Dreamer, and Mixed. The Mixed persona is different from the others; in general, they are good at planning and technology and understand the rostering system and process. However, the Mixed does not present the majority group; in fact, most people in this group also work as ground staff. The planner is the majority group among the current crew member; most of them have problems with the current rostering system or do not use it properly. The project is aiming to produce an interface that will be used for at least for 10 years, and the Dreamer will be the majority group in the future because this category represents the next generation of FlyCo cabin crew. So, my target group in this project will combine the Planner and Dreamer. The UI concept design will consider the needs and wants of these two groups.

4.3 DEVICE AND ITS INTERFACE DESIGN: IPAD AS MAIN TOOL

I chose the iPad as the main device for the crew rostering app. Firstly, the iPad is the FlyCo office tool for the crew. All crew members have an iPad for all FlyCo apps, so they are very used to managing their work on the iPad. Secondly, the phone screen is too small for such a complex system, and there is too much information, so people would feel overloaded by it. Thirdly, for safety and privacy reasons, it is better to install all FlyCo applications on FlyCo devices rather than on personal devices. Fourthly, although the desktop is the right size for this kind of front-end system, it lacks mobility, which very important for the crew since mobility is the job's professional nature. Therefore, I chose the iPad as the main device for the new roster app. Of course, the application could have a website version to accommodate different user behaviors. But in this project, I will focus on the iPad version UI design



IPAD INTERFACE DESIGN PRINCIPLES

There are not many studies of iPad or tablet interface design principles. In fact, most apps in the iPad are the larger screen size versions of the smartphone ones. Before I go into detail about the UI concept, I start with how people physically hold an iPad, which will influence how to arrange the navigation and other UI details. The article “Responsive Navigation: Optimizing for Touch Across Devices” (Wroblewski, 2012), states there are two ways to handle an iPad: with two hands along the sides or placed on a table or the lap. (see Figure 30) Both ways level the touch area of the tablet screen. Figure 31 shows levels of easy, satisfactory, and difficult to tap the screen area. So, for the UI concept design, I should keep the main function bar or bottom on the easy level, or at least in the satisfactory area. Since the bottom area has the most common and important interactions, it should be the area the user can reach easily and quickly.

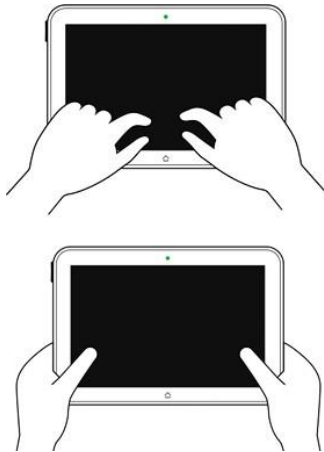


Figure 30. Two ways to hold iPad

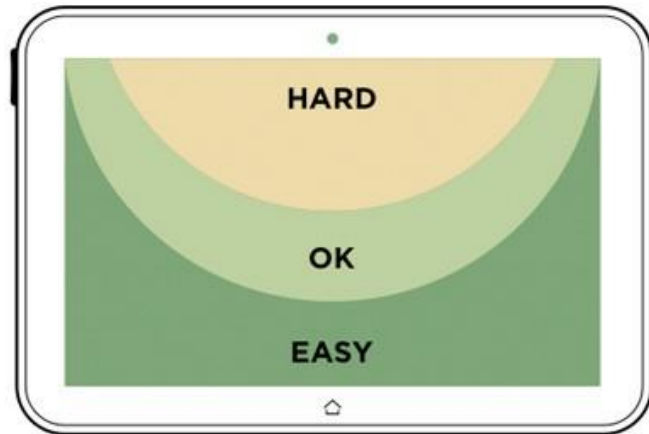


Figure 31. Difficulty level of tapping interaction

Chapter 5.

IDEATION

concept. The ideation in this project is not easy. Due to the special and professional nature of this project, only one creative session provides some inspiration, which is the Make a World section from the group session with the crew. The creative session I hosted with other designers does not work. For the non-crew group, it is hard to imagine how their life should be and what kind of tool they should have. Also, the designers do not have any knowledge about how the roster process works or about the needs and wants of Cabin crew. After defined the insights from research and the design focus, I brainstormed and came up with a couple of concepts. In this chapter, I will present the concepts I created, and the chosen concept.

5.1 UI CONCEPT EXAMPLES

During the ideation, there are many ideas of interface and interaction style. With go through the design criteria, and target group again, I pick three UI concepts to have deeper comparing and analysis.

1. Cards interface

In this concept (see Figure 32), the user can quickly switch between the function page and have clear idea where they are in the app. But with details design and evaluation with other designers, changing the main function is not frequently used. The user, the crew, will focusing on the function that managing the roster. Other features should be the secondary supporting functions.

2. Wheel control interface

The wheel control button (see figure 33) is good at switching between the function and could be inconspicuous in non-use situation. However, the design is too vanguard concept for the target group. And it is not commented design in iPad, and it may cause confusion and a longer learning curve in practical.

3. SIDEBAR WITH FLOATING BUTTON

The sidebar with floating button concept (see figure 34) has two function buttons allow user to switch between the features easily. And the side bar provides more information and other small features in the bigger functionality. All the elements together support the complexity and multifunction of rostering. Also, the floating button gives great guiding for user. Therefore, I chose this concept for further design iteration.

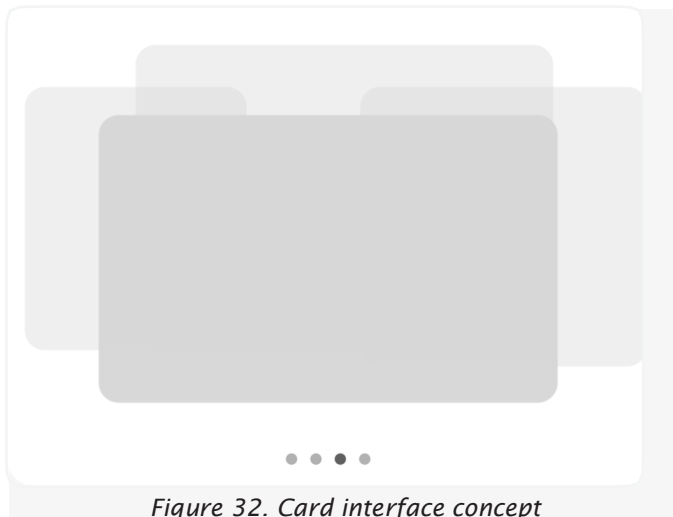


Figure 32. Card interface concept

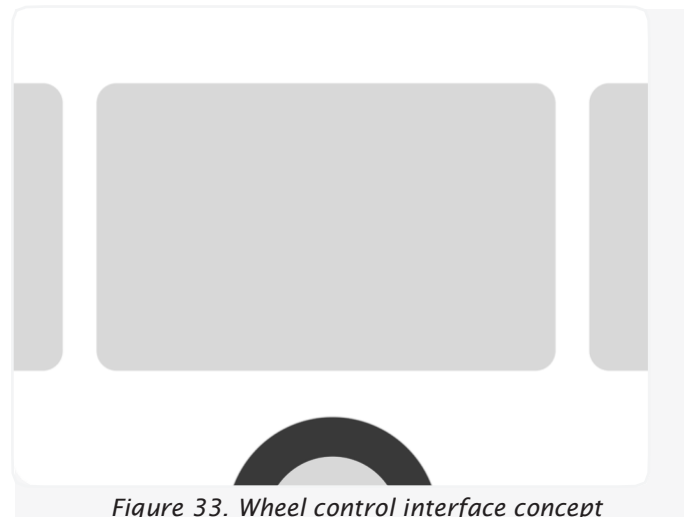


Figure 33. Wheel control interface concept

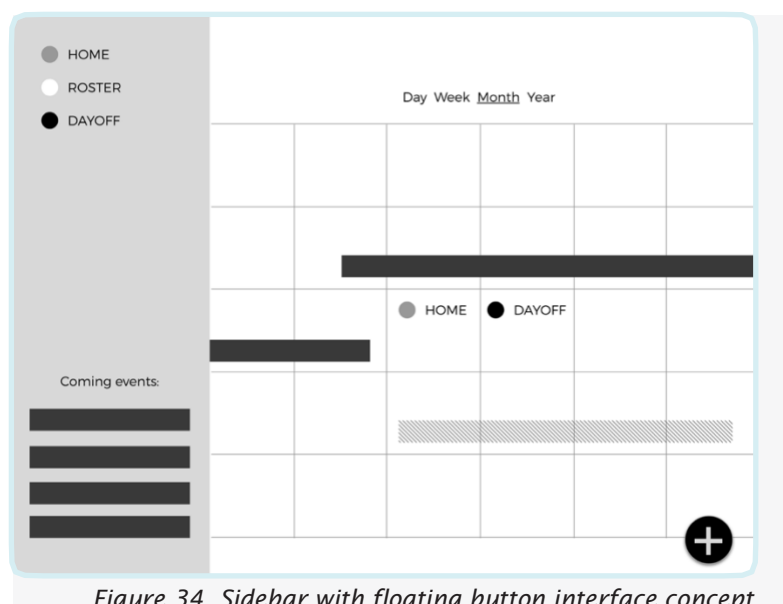


Figure 34. Sidebar with floating button interface concept

52 CHOSEN CONCEPT

The chosen concept *Sidebar with floating button* has two function buttons and one collapsible sidebar to support the complexed features that rostering system requires and divide the feature into the section which guides the user during the usage. And this concept will be the combination of iOS design and Material design. The reason I chose to make one combination UI design style is the complexity and multifunction of rostering. iOS design has a sort of minimalism and settled design (flat design) style which can deliver the information clear and straightforward. And material design in another hand, it has highlighted the few but essential elements which the user cannot miss. Notably, the floating button is an affordance interface design to guide the user how to use the application (where to tap).

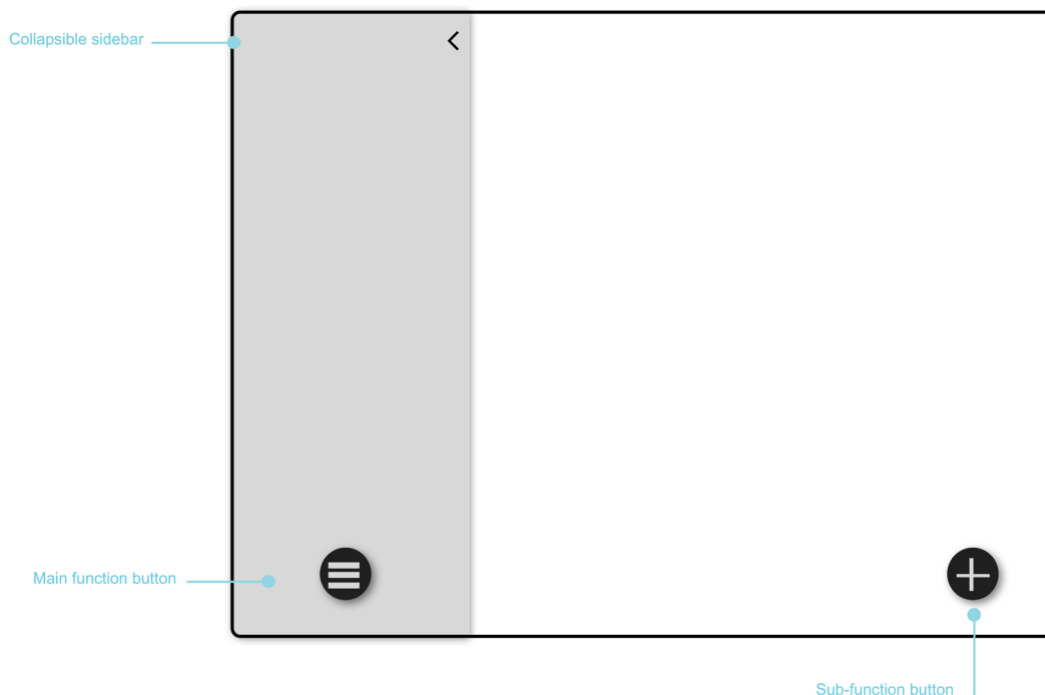


Figure 35. Chosen concept: Sidebar with floating button

- **Main function button:** this button works as the home button, it provides a convenient way to switch the main functions inside the app;
- **Sub-function Button:** as the name of this button, it gives the sub-function of its main function;
- **Collapsible sidebar:** the sidebar mainly is the support tool for the main functions, it will contain the small feature and information that the user needs for the main functions.



Chapter 6. ITERATION

In this chapter, I will present my iteration process, from wireframe to prototype 1.0, ending with prototype 1.5.* There are two rounds of iteration in this chapter, including evaluation and improvement.

⌘* Prototype 1.5 is the version that is ready for the final evaluation.

6.1 FROM WIREFRAME TO PROTOTYPE 1.0

I start to illustrate the concept in detail. Wireframe is the first step, where I draw out the main screens with main functions and try to figure how the information and features should be placed, and the interaction between the screens. After I finish the wireframe, I summarize the function flow and make the first version prototype. See the details in Appendix. Wireframe

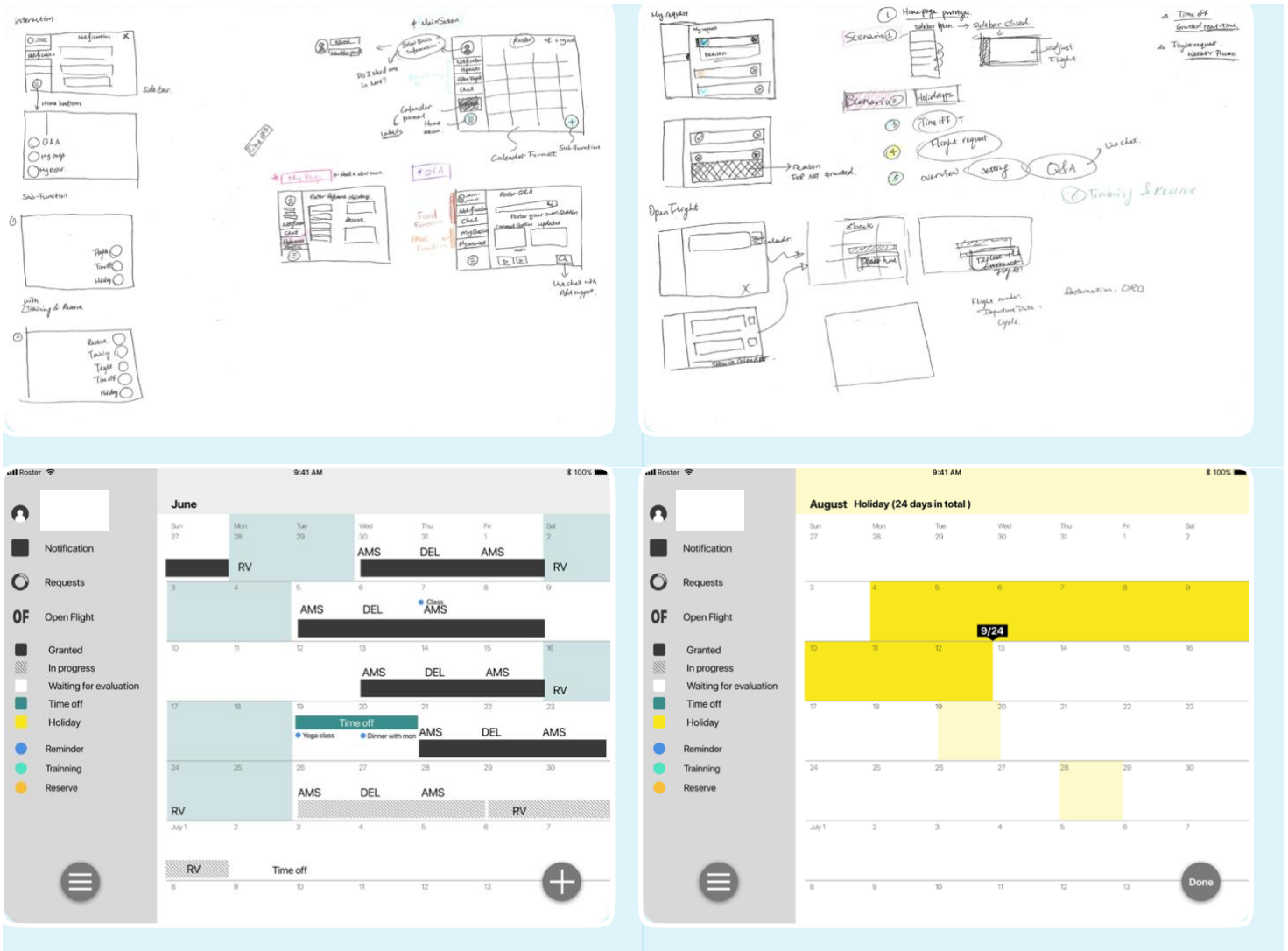


Figure 36. Wireframe sketches

6.1.1 FUNCTION FLOW 1.0

Figure 37 shows the first vision function flow of future rostering system. It has three parts: the function layers (blue area), process (yellow area), and actions (green area). There are three function layers: main functions, functions, and sub functions; they are the features of the app. The process is the self-rostering process inside the application. The last one is the action, which shows the kind of action the user can take to manage their roster, and together with the process it completes the self-roster process. And I design the function flow in wider not in depth, because more depth the function flow is, the user will feel more confused and lost in the system. Therefore, I design the flow on a broader scale and shallow, and the user can find their function quick and easy.

/// The red area is the process for how the user should receive the information in this app and is not a relevant concept in function flow.

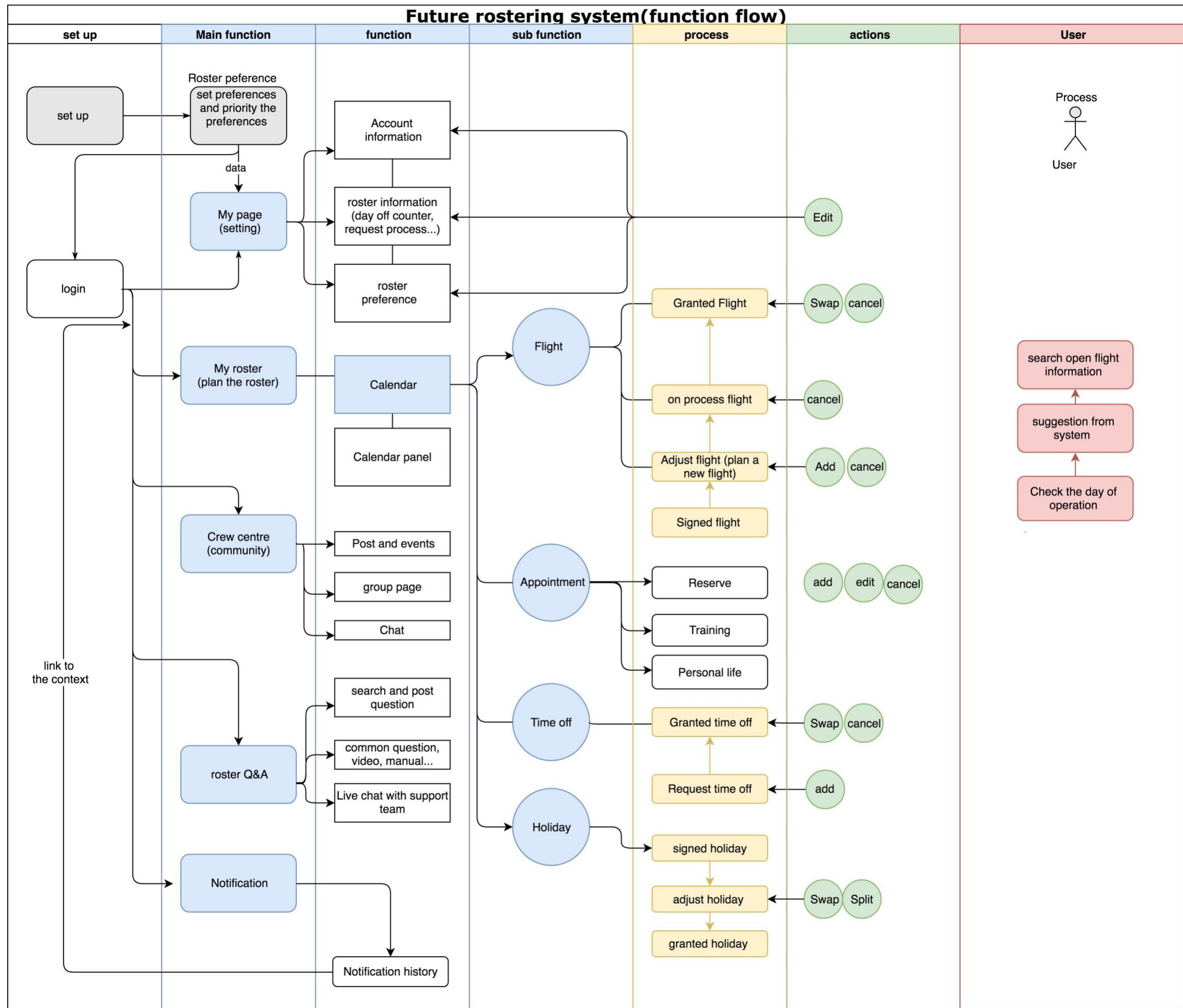


Figure 37. Function flow 1.0

MAIN FUNCTIONS

There are four main functions in this app: My Page, My Roster, Crew Centre, and Roster Q&A. Each function provides users with the features and information that the crew needs for self-rostering. The following figures show the wireframe of the design, so the interface design is not applied yet.

- **MyPage** is the personal preferences and settings function, where users can change their roster preferences, edit their personal profiles, and check their account information. The users create their own personal roster profile here which allows the back-end system to roster with their demands.

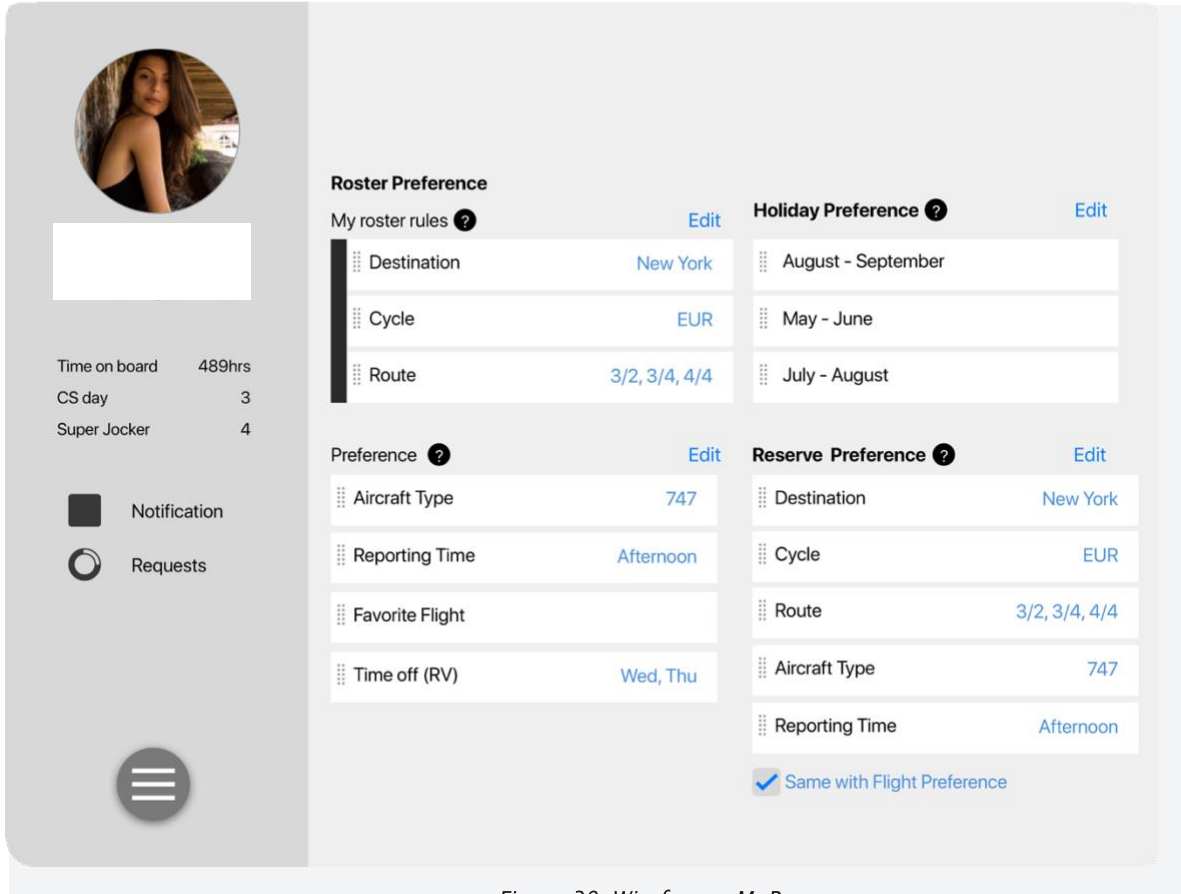


Figure 38. Wireframe: MyPage

- **MyRoster**, figure 39, is the primary and biggest function in the whole app. Also, it will be the main screen of the app, because users will manage, check and track their roster in this function. It has the calendar view, which allows users to check the information more easily. The calendar view shows all the flight information, time off, holidays and other dates (e.g., personal events, safety training, reserve period). Meanwhile, users can manage their roster here by swapping, dropping flights, scheduling time off and holidays, and making requests.

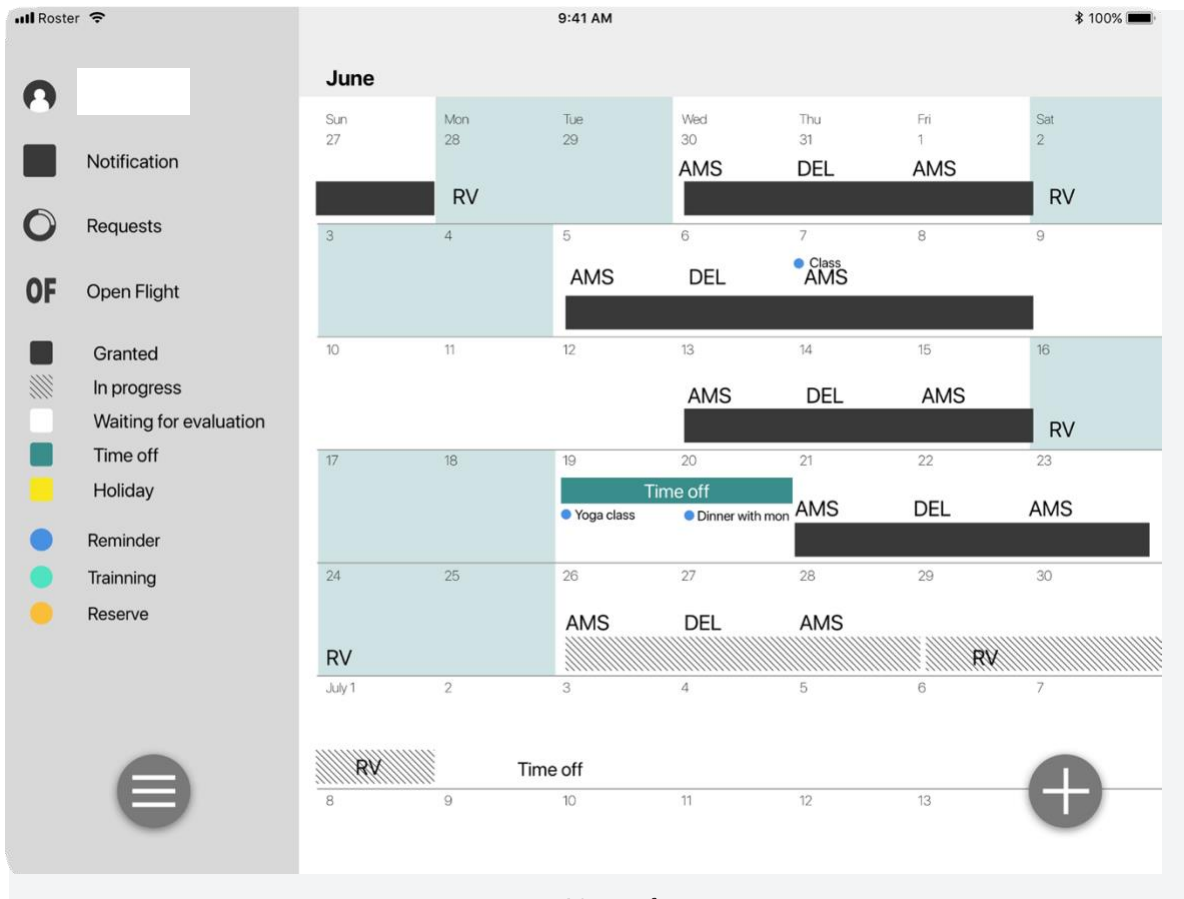


Figure 39. Wireframe: My Roster

- **Roster Q&A** is the place where users should go when they have any questions related to the roster. It is also the official channel for the crew to ask for help from the P&A support team via live chat. As well, the crew can search and post their questions, and check the tutorials or manuals that the support team provides.

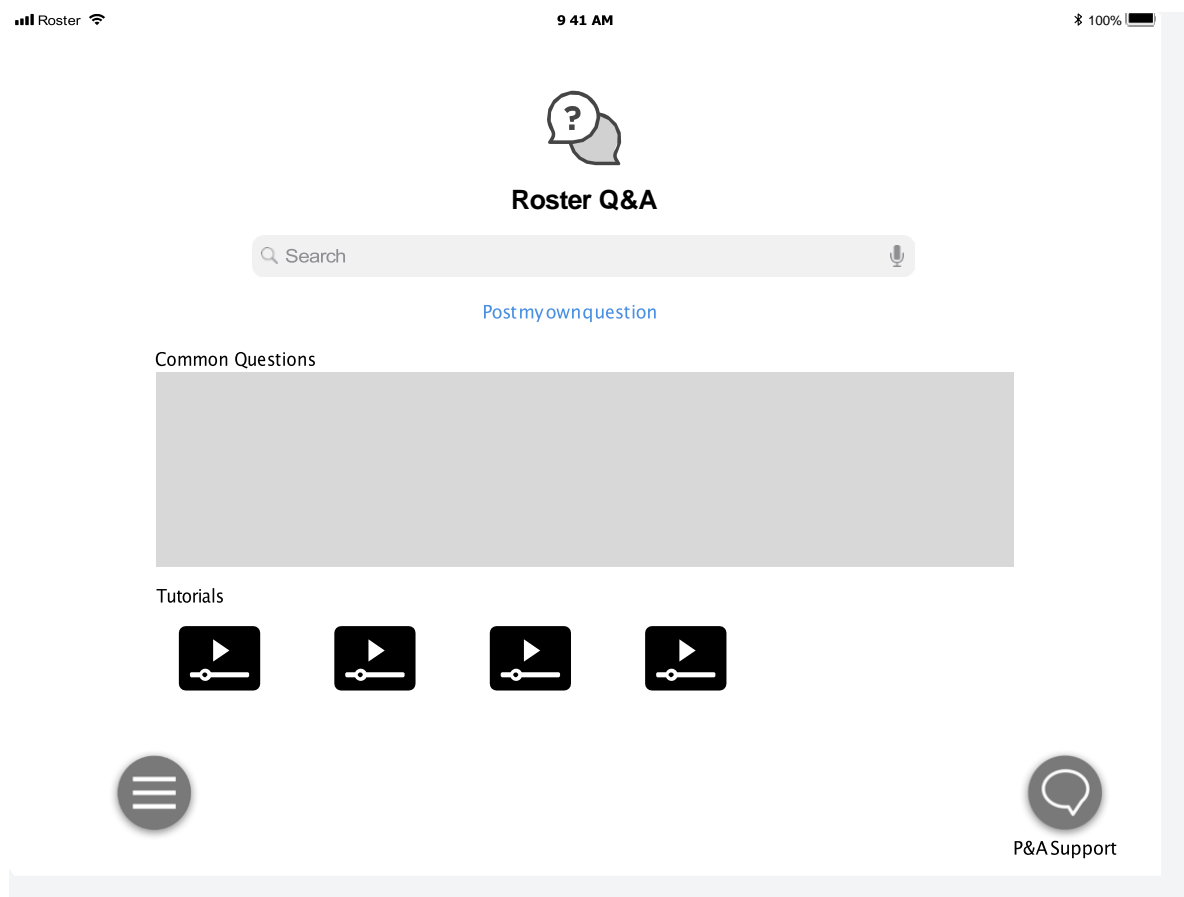


Figure 40. Wireframe: My Roster

- **Crew center** is the function that brings the crew together. It is an online community where the crew can ask questions, meet other crew members, and help each other. Users can also make posts and events here and create a group page. They can also chat here, so it is the social element in this app.

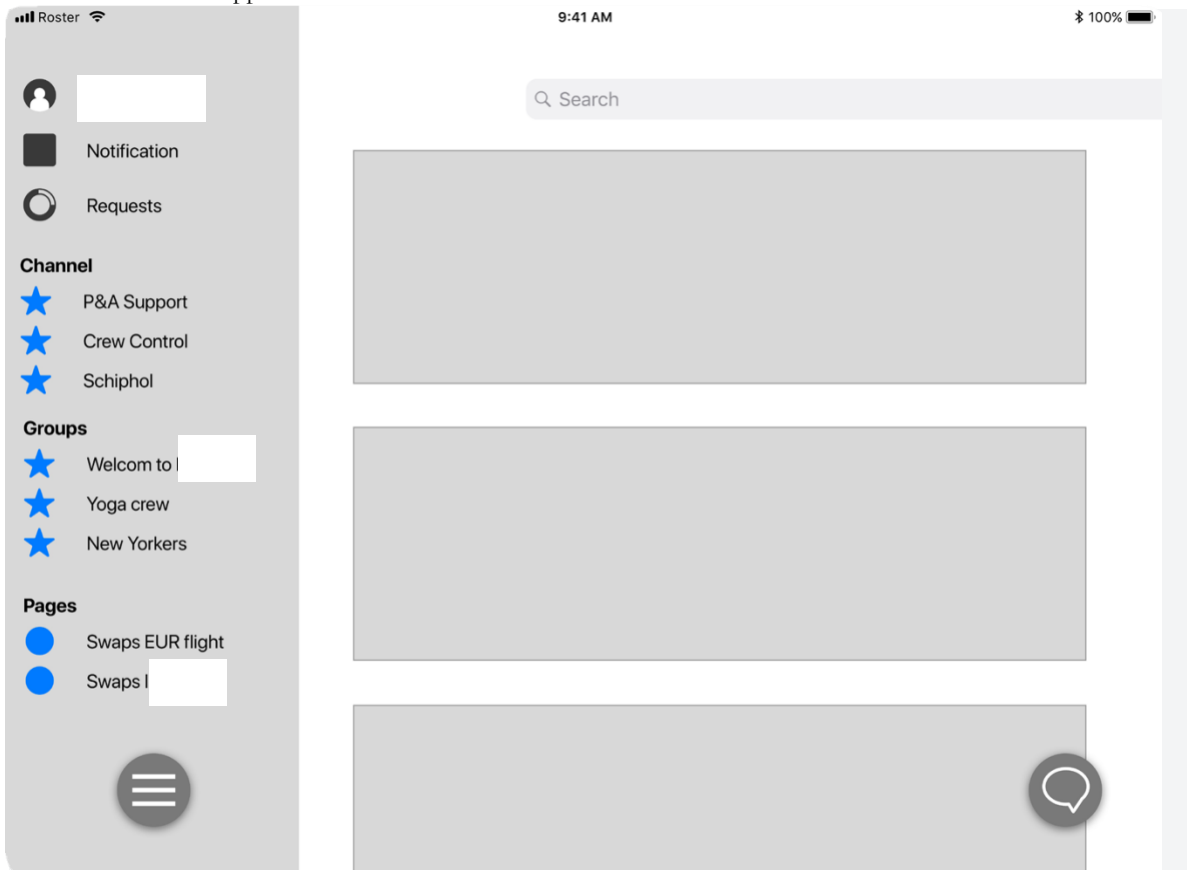


Figure 41. Wireframe: Crew community



6.1.2 USER FLOWS 1.0

To create a completed system, I incorporated different tasks into the user flows in order to think about potential situations that crew may face. This also helped me to complete the first prototype.

1. Long-term planning

For long-term planning, there are three situations for the user: plan their annual leave/holiday, make their flight request, and manage their roster. The holiday planning in the back-end system assigns the holidays based on user's holiday preferences from the My Page function. Once users obtain their assigned holiday, they can swap or split it to get their desired period. Differently from the current flight request system, there are no time limits to making the request. Users can make requests at any time, and the front-end system will run the regulation assessment to check the request's qualification. The request will then go through the weekly evaluation for operating. Meanwhile, the user will receive notification to track their request. Users can manage their roster via swapping, dropping and making new flight requests.

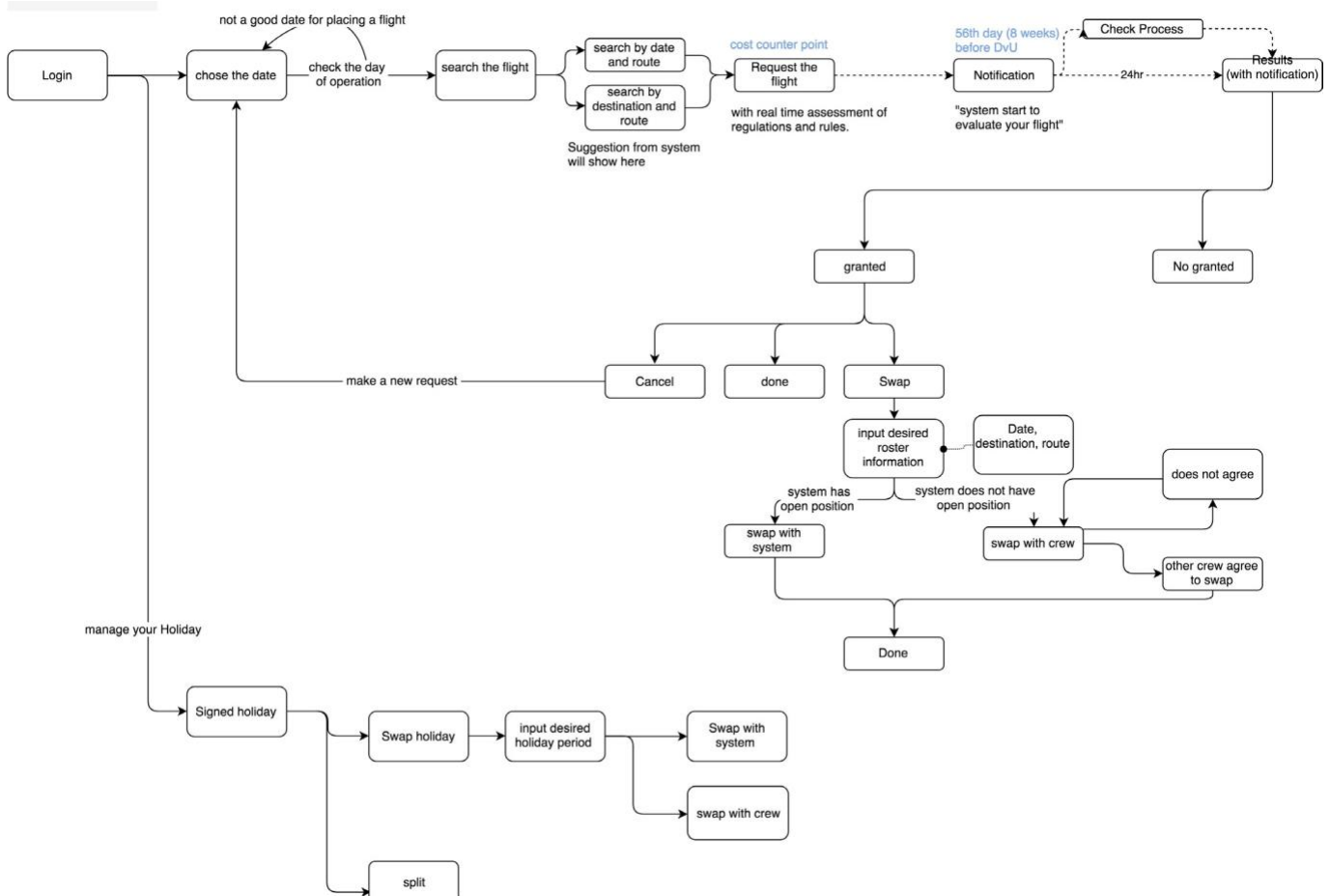


Figure 42. User flow: Long term planning

2. Short term planning

This period is after the crew member gets his or her roster. Users can adjust by swapping, dropping and picking the flight, and can also make flight requests again.

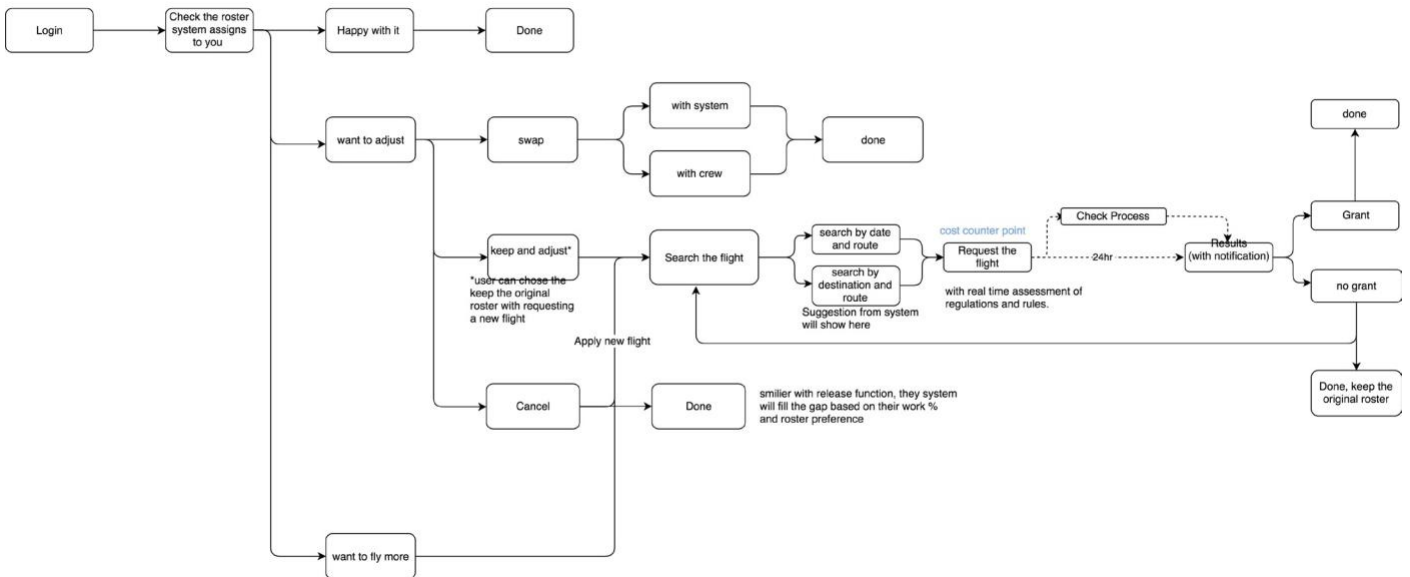


Figure 43. User flow: short term planning

3. Others

This user flow includes how to request time off, and how to use Crew Community, Roster Q&A and Appointment situations.

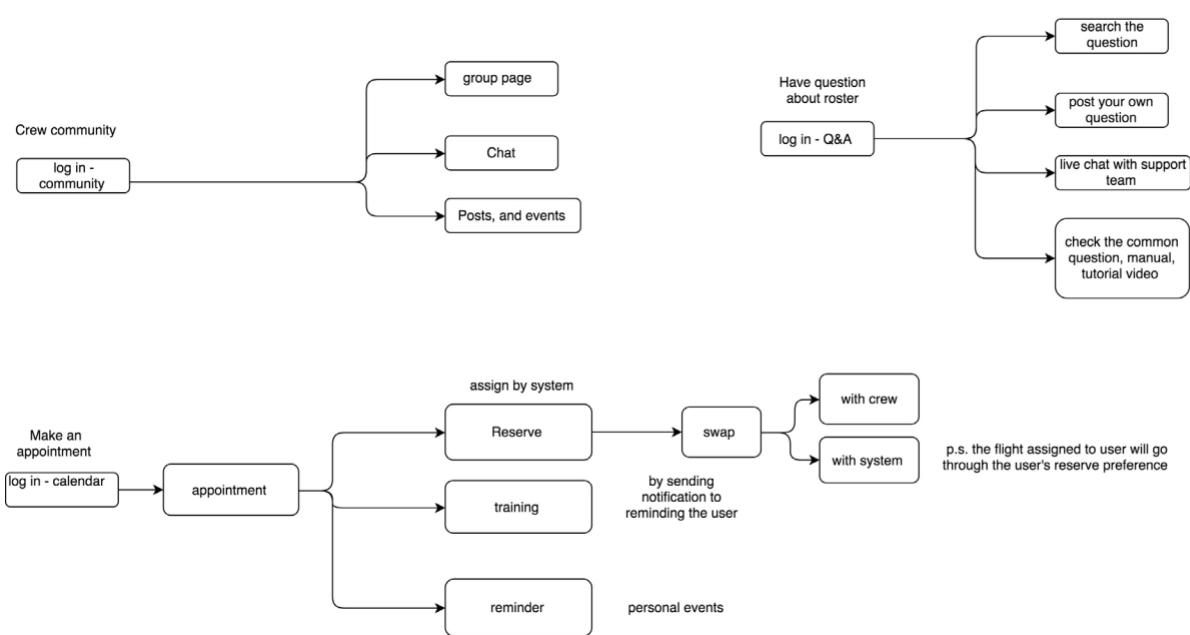
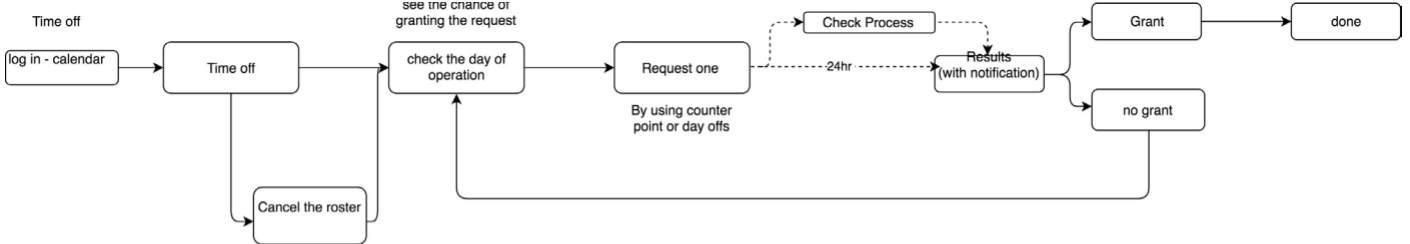


Figure 44. User flow: Others



6.2 EXPERT REVIEWS AND CONCEPT IMPROVEMENT

Before I started the usability testing, I made a demo version prototype for sharing the concept. The demo is at the wireframe stage because I want the experts to focus on the concept itself, not the look and feel. The demo prototype has five parts: Home screen, Plan holiday, Plan time off, Flight request, and Adjust flight. In this review, there are group meetings and individual meetings, and in total 7 P&A staff and 10 crew members participated.

GOALS OF THIS EXPERT REVIEW:

- Finalized the concept;
- Check the possibility with FlyCo regulation, technique;
- Feedback and improvement.

INSIGHT FROM THE SESSION AND ITS IMPROVEMENT:

1. Excrescent Social elements

The social element was referred to multiple times, so it seems to be a crew need. Crews want to have online community that they can help each other, exchange the roster information. However, during the design period, I discovered the rostering itself is a complicated process. For example, the crew's roster includes their personal life, flight route, day off, training, reserve period and so on; and crew has to deal all above things to complete their roster. Adding an online community inside the application is too much for an app. So, I dropped having a community page in the application, and instead chose to have a chat function* in the design. However, according to the expert review, the chat does not improve the experience very much.

"It is not bad to have a chat in the app, and I can discuss roster with the friend. But we already have Yammer and WhatsApp"
-Female, 100% 2 stripes(crew, Expert review during iteration period, 2018)

In fact, Cabin crew has an official channel, Yammer, and a Facebook page to communicate with other crews and the company. There is no need to make one more communication tool, since Yammer and Facebook are mature, successful and have complete online communities. So, in the end, I replaced the chat function in the sidebar by live chat with P&A support. In this way, the crew can easily find help whenever they have a problem with rostering.

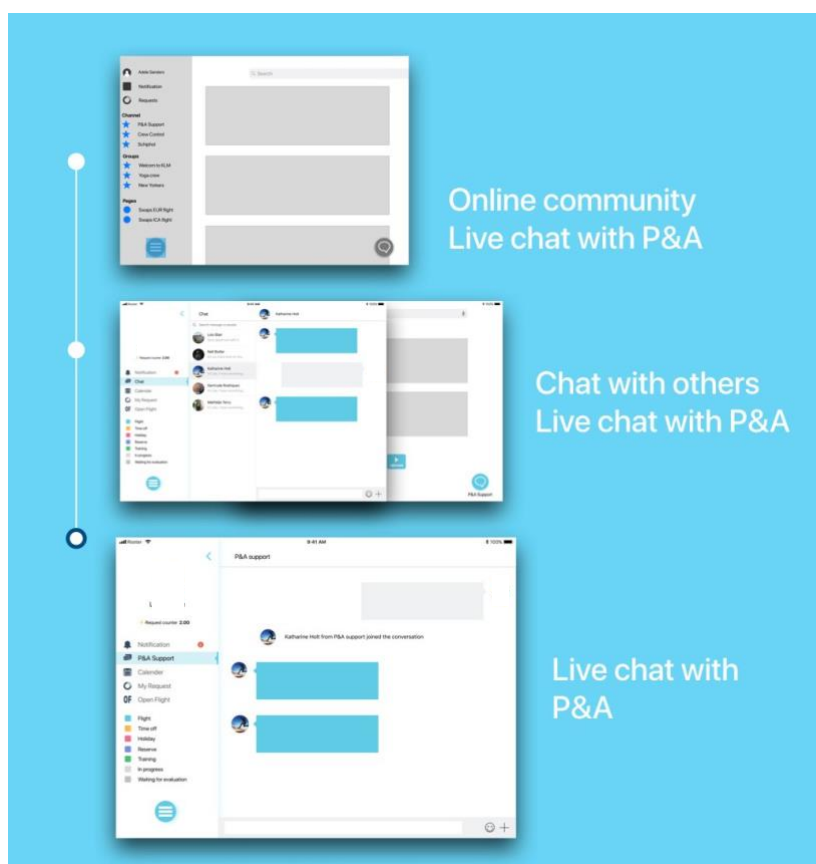


Figure 45. Improvement of social elements

* The Chat function is communication between crew, with group or individual.

2. Overload information in calendar

In the review meetings, when I presented a wireframe (see Figure 39), the participants commented there was too much information in the MyRoster. When the crew checks the calendar, the primary information should be to identify the dates of workday and day off. The secondary is where to fly. Therefore, I designed three simplified interface styles, and showed the design to experts during the review meeting.

- FlyCo colour palette style (Touch of orange)
This shows the clearest difference between trip and day off, but it is not clear what the colors and shapes represent. Also, with different length lines, some participants think the visual could be chaotic if you have full three-month rostering in the calendar. (Figure 46)
- Dot and line with Calendar gray
The color combination in this UI style is comfortable and calm. Together with the standard gray box in the general Calendar design, it establishes for the user a clear difference between work day and day off. But the dots (which represents the flight departure and arrival) on the line are hard to see and redundant. And the line is too thin to suggest it is clickable. (Figure 47)
- Blue Bar and Calendar gray

This appearance of this design most distinguishes workday from day off. The color palette is same as the last UI style, calm and comfortable. Most important, the participants can understand the interface's information without explanation. Moreover, the participants intuitively tapped the blue bar to see if there was any more information. Therefore, I chose this UI style for the rostering information representation in My Roster function. (Figure 48)



Figure 46. My Roster UI style: Touch of orange

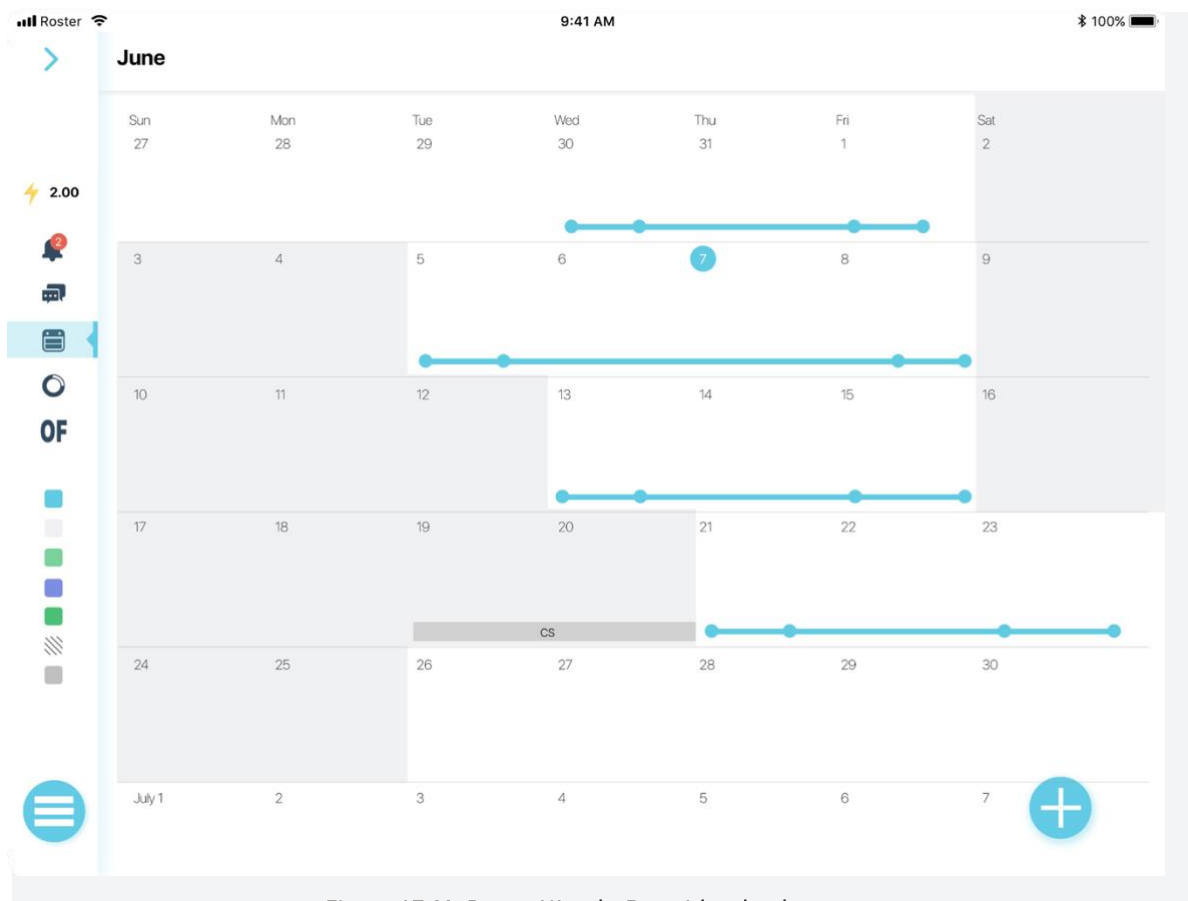


Figure 47. MyRoster UI style: Dot with calendargrey

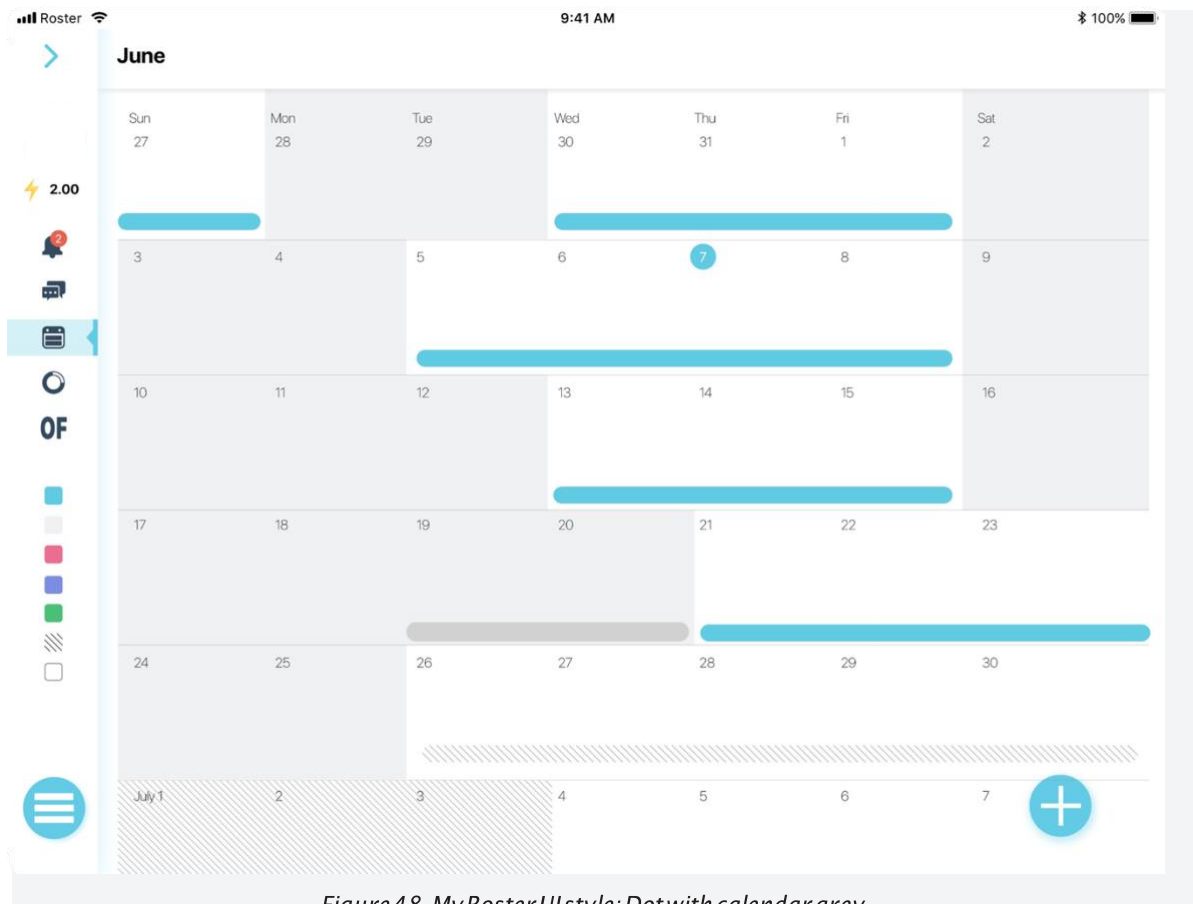


Figure 48. MyRoster UI style: Dot with calendar grey

6.3 PROTOTYPE 1.5

6.3.1 ROSTER PROCESS

The roster process is simplified and summarized from the user flow. The process is a combination of real-time assessment¹ and weekly evaluation². (see Figure 49)

1. The process starts with holiday planning with real-time assessment, because it has to be months early for P&A's roster operation.
2. Then, the crew can plan their time off. From the feedback in the online survey, sessions and interview, long-term certainty is always in high demand from the crew. Planning their time off early (e.g., 4 months earlier) solves the uncertainty problem for the crew and helps them to plan their life. Meanwhile, the crew can make their flight requests anytime, but the weekly evaluation will start based on the back-end operation. Each crew member can create their roster profile/preference in the app. The back-end rostering system will assign the roster in accordance with all the information and requests from crew.
3. After the crew gets their roster, they can adjust it (short team flexibility) by swapping with system/other crew, dropping the flight, making time off requests, and picking a flight from the open flight pool.

¹ Real-time assessment: based on user's profile (from My Page), the back-end system and P&A stuff can steer the operation first and gives the user a certain range freedom to manage their roster.

² Weekly evaluation: FlyCo needs the weekly evaluation to optimize the operation in whole company scale.

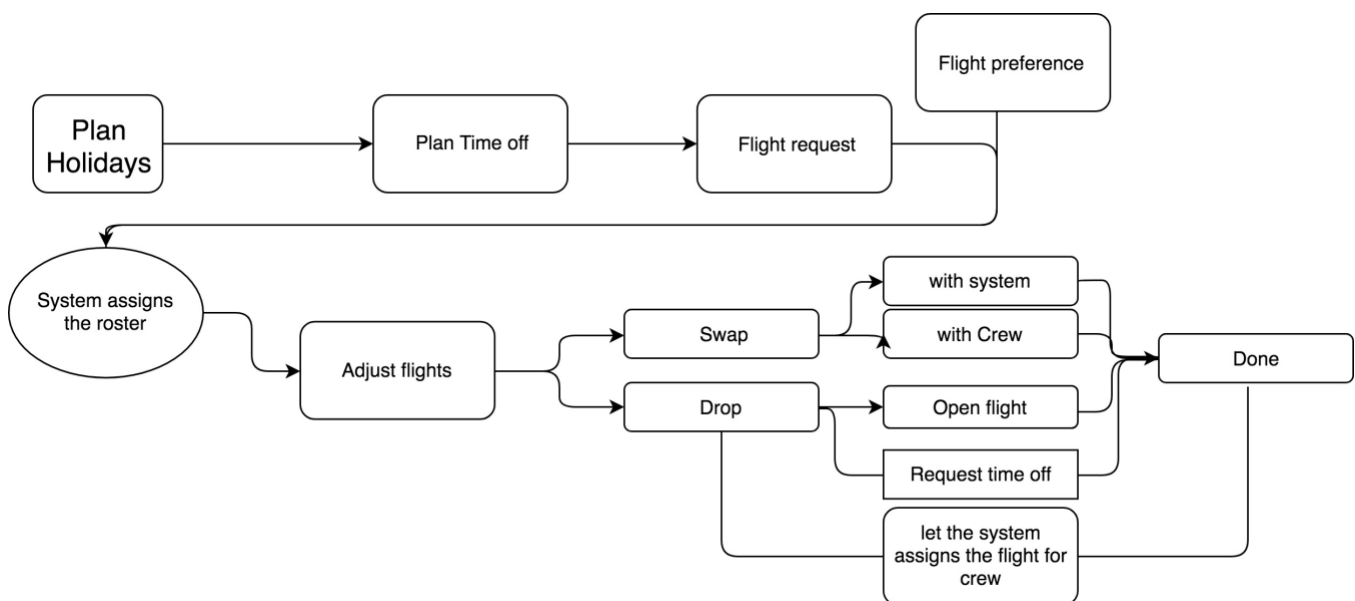


Figure 49 Roster process

6.3.2 FUNCTIONS

After the reviews, the new main functions of the application are My Roster, My Page, and Q&A.

There are the functions in the prototype:

- My Roster
My Roster is the main screen of the application, because it is the most important and frequent interaction and core function in the application.
 - Sidebar: Notification, Chat with P&A support¹, Calendar view, My Request, Open flight, and Calendar legend
 - Sub-functions button, it only appears in the My Roster function: Plan holiday, Plan time off, Flight request, Reserve, Safety training²
- My Page
My page is the setting function for each crew. Crew create their roster profile/preference here and see their account information and roster statistics over the year.
 - Sidebar: Account information, Notification, Chat with P&A support, Roster preference, and Roster statistics
- Q&A
In the Q&A function, the crew can search the questions, post their own questions, check the roster news from P&A, and see the frequently asked question and tutorials. Also, they can check the questions they ask in My Q&A function.
 - Sidebar: Account information, Notification, Chat with P&A support, Roster Q&A, and My Q&A

¹ Notification and Chat with P&A support always show in the sidebar in every main function interface, due to the importance of information updating and help support in the app.

² Reserve and Safety training is not a regular function, but only appears in the app when the user needs to do the duties.

6.6.3 UI STYLE

User interface plays the vital role in creating the user interaction of the app. It presents the information and guides the user. Therefore, I will present here color palette, font, navigation, and other visual designs, and the reasons why I chose them.

COLOR PALETTE

The primary application colors are neutralized to allow the sparse usage of the primary blue and content to take center stage. Moreover, the color blue is the FlyCo color, and all other FlyCo applications have blue and white as primary colors.

The secondary application colors support the sub function in the My Roster function. Each sub function of My roster is branded with a color and an illustration, and these colors are desaturated to work better with the primary blue color.

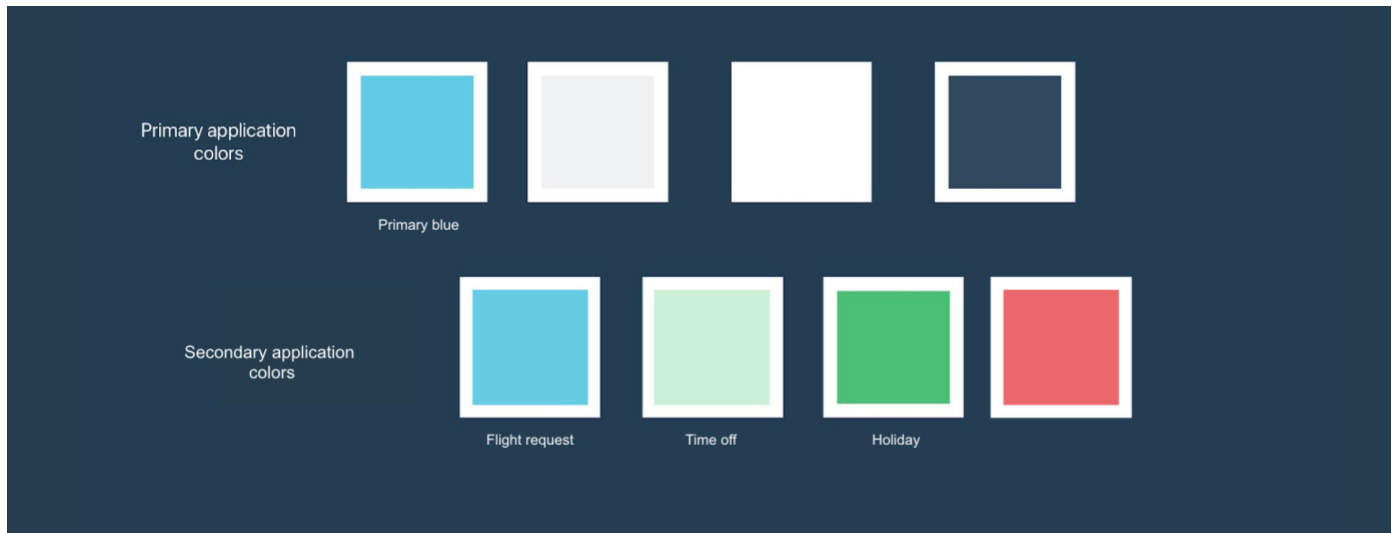


Figure 50. Color palette in Prototype 1.5

FONT

For the font, I chose San Francisco. San Francisco is the newest iOS system font, which will be harmonious with the rest of the system in the device.

NAVIGATION: BUTTON AND SIDEBAR

As I previously mentioned, the floating button and sidebar compose the navigation in app. Two navigations have their own role and function.

- **Sidebar:**
As stated, I mixed the iOS (or flat) design and material design in the user interface, and the sidebar has the most representative. The sidebar itself is a flat design. The icons, font and color are a settled and simple design. The sidebar has the blue drop-down shadow to make a floating effect which disintegrates from the rest of the interface to highlight its functionality. Also, it is a foldable sidebar, so it won't affect information presenting when it folds.
- **Button:**
Similarly, to the sidebar design, the button icon itself is flat and settled but with a drop-down shadow. It makes the button stand out, and easy to find, which can guide the user more clearly.



Figure 52. Prototype font

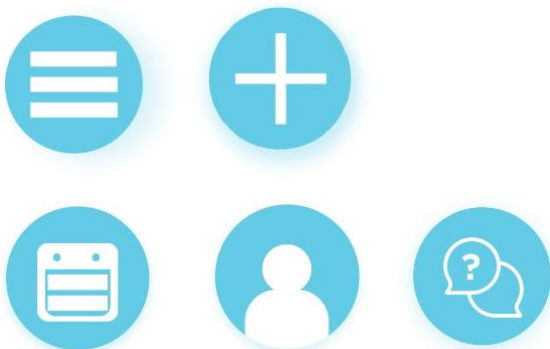


Figure 54. Navigation: button

HEADER DESIGN OF SUB FUNCTION IN MY ROSTER

My Roster is the main function in the app, so the user has a high level of interaction with it. For delivering precise information, I design the sub function's header by using different secondary colors to distinguish the functionality.

- Request flight: I draw a typical FlyCo plan and earth figure to represent crew's daily work;
- Plan holiday: I illustrate a road trip situation to represent the annual leave;
- Planning Time off: the camping image represents the long weekend activity.

All the header illustrations could be easily replaced by any other images or drawings. They are good to have for distinguishing the functions.

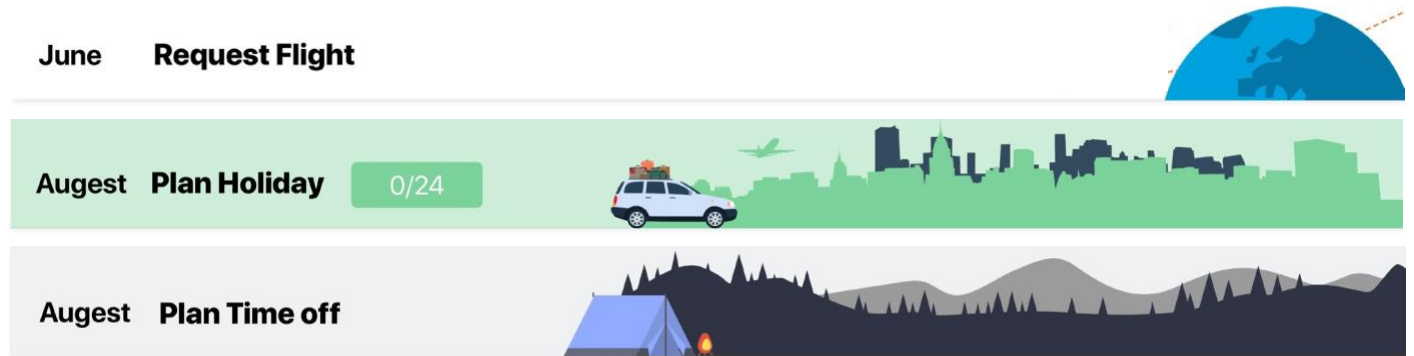


Figure 55. sub function headers in My Roster

Chapter 7.

EVALUATION

After several changes and improvements, the prototype is ready for the final user testing with the user group. For the user testing, I built an interactive prototype 1.5. In this chapter, I will present the Procedure, Results and Improvement. Procedure – consisting of the goal, the method, the setup and the participants- of the user testing will be explained. The results of the testing and improvements I made based on the results will also be presented.

7.1 PROCEDURE

The procedure of the user testing will be discussed. The goal of the user testing, and why the testing is conducted, will be shared, then the method I used during the test and in testing the environment's setting, and finally the participants, who they are. See user plan in Appendix. User testing.

GOAL

The main goal of the test is evaluating and validating the design concept with the user, to identify any usage issues and other feedback to improve the prototype and concept. Usability can be divided into three parts: effectiveness, efficiency, and satisfaction in use. (Vermeeren, 2017) Since my prototype is not a fully functional app but is a concept level prototype, I will focus the effectiveness and satisfaction of use in this test. The effectiveness should be tested in further development prototype.

The sub goals, the few touch points that I want to verify during the test are:

- User's preferences in theme color on sub functions: H-app and Time off*
- Identify weakness and strengths of the prototype
- Identify the clarity of visual elements in the prototype

* During the expert review, one participant suggested use of similar color on Time off and H-app, so I want to ask for participants' preferences and thoughts on this.

METHOD

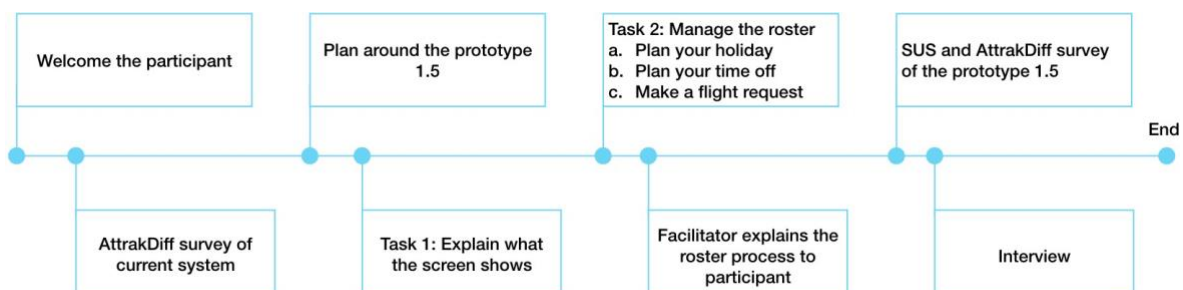
The user testing is conducted by asking participants to finish two main tasks, three surveys and one interview. Figure 56 shows the user testing process. First, I ask participant to fill out the AttrakDiff survey of the current system to gather data for later comparison. Before starting the tasks, participants are given a chance to play around with the prototype to get used to the interface and interaction, and explore the app. There are then two main tasks for participants to try out on the prototype:

- **Explain what the screen shows, in this task, I want to verify the clarity of user interface design.**
- **Manage the roster: plan your holiday, plan your time off, make a flight request; this task reveals the effectiveness of interface design.**

The details and tasks of the user testing are shown in the Appendix. User testing. During the test, the participant is asked to think aloud during the whole process, while I observe and take notes during the whole session. The process is recorded. After participants finish the test, there are two surveys: System Usability Scale (SUS) survey and AttrakDiff survey. Both surveys focus on the prototype 1.5. At the end of session, I interview the participant about the whole experience.

The quantitative data will be collected via three surveys: one System Usability Scale (SUS), two AttrakDiff surveys– the first survey is about the current Request system website; the second one is about the prototype 1.5 – of the prototype to produce comparisons on user experience of the two systems. The surveys indicate satisfaction with use. The qualitative data will be collected during the observation during the test and interview at the end of the session.

The location of the user test is in the UX Lab in FlyCo crew center, which is convenient for the crew to have meetings. Since most of crew manage their roster on mobile devices and the prototype is digital only, it does not involve physical interaction, so the location is not a big influence in the experience.



* Participant was asked to think aloud during the whole session

Figure 56. User testing process

SETTING

Figure 57 shows the test's setting, where the participants sit in front of the prototype and camera, and the camera is recording the prototype screen for later interaction analysis. I am the observer and evaluator in this test. I take notes during the test, and I sit next to the participant, a position that enables me to see the prototype screen and the participant's facial expression. To ensure that I do not miss important information and feedback, I use my phone as a voice recorder during the interview session, and the camera to record the participant's actions on the screen.



Figure 57. User test setting

PARTICIPANTS

I tested the prototype with 11 people in total, but one of them is the pilot test; therefore, the pilot participant's data won't be part of the results. The participants in the test are the same group as user group. Instead of testing all 10,000 crew members, I created a focus group which has 10 participants. I carefully choose the participants based on the persona I built during the research period, because I wanted to make sure my test results were not biased by only testing one or two personas. Therefore, the group includes four planners, three dreamers, and three mixed. The user test protocol is provided in the Appendix, User testing.

7.2 RESULT

In this section, the results of the user test will be analysed. The conclusions from the results will be used in Chapter 7.3 Improvement.

7.2.1 USABILITY: EFFECTIVENESS

All the participants were able to finish all tasks. Chart. Effectiveness diagram shows whether the participant finish the task with or without help. Each participant is grouped into one of the personas. Five participants finished the tasks without help, and five needed help to finish the tasks.

- The reasons participants can finish the tasks without help are:
 - Familiarity with the interface, so they can use the prototype without guidance;
 - Always can go back. During the test, participants state that they like the feature that enables them to go back to the last layer, or return to the home screen via navigation. Knowing this, they are not afraid to make mistakes, and they dare to explore.
 - Clear labels and icons on functions; since all the participants are first-time users, they rely on the labels and icons to understand the functionality.
- The reason participants need the help to finish the tasks are:
 - The format, the prototype, is an app, and the current system is a website. Some participants show difficulty to switch their minds during the tasks to adopt the new format and interface;

- Need time to learn the new app;
- Limitation of prototype, since the prototype is not a functional prototype but a concept prototype
The functions are not functional, which confused a few participants during the test.

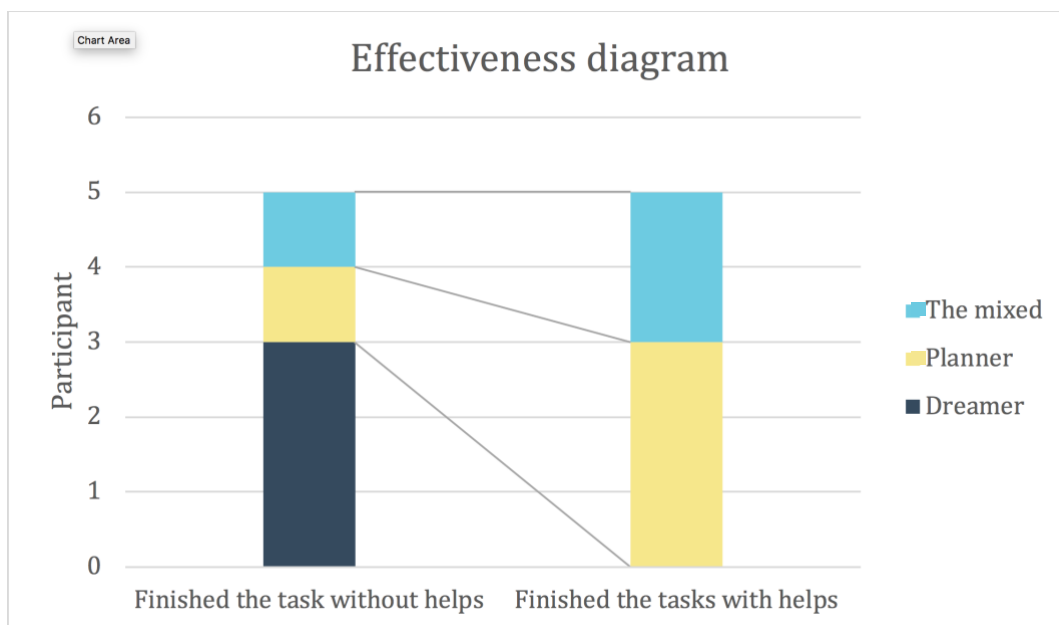


Chart 1. Effectiveness diagram

IMPRESSION OF THE PROTOTYPE

During the interview, I asked the participants to share their impressions about the prototype. The prototype's UX character shows the character that they mention about the prototype during the test. It has three topics: Interface, Interaction and Others. Overall, the participants share positive impressions of the prototype.

Prototype's UX character

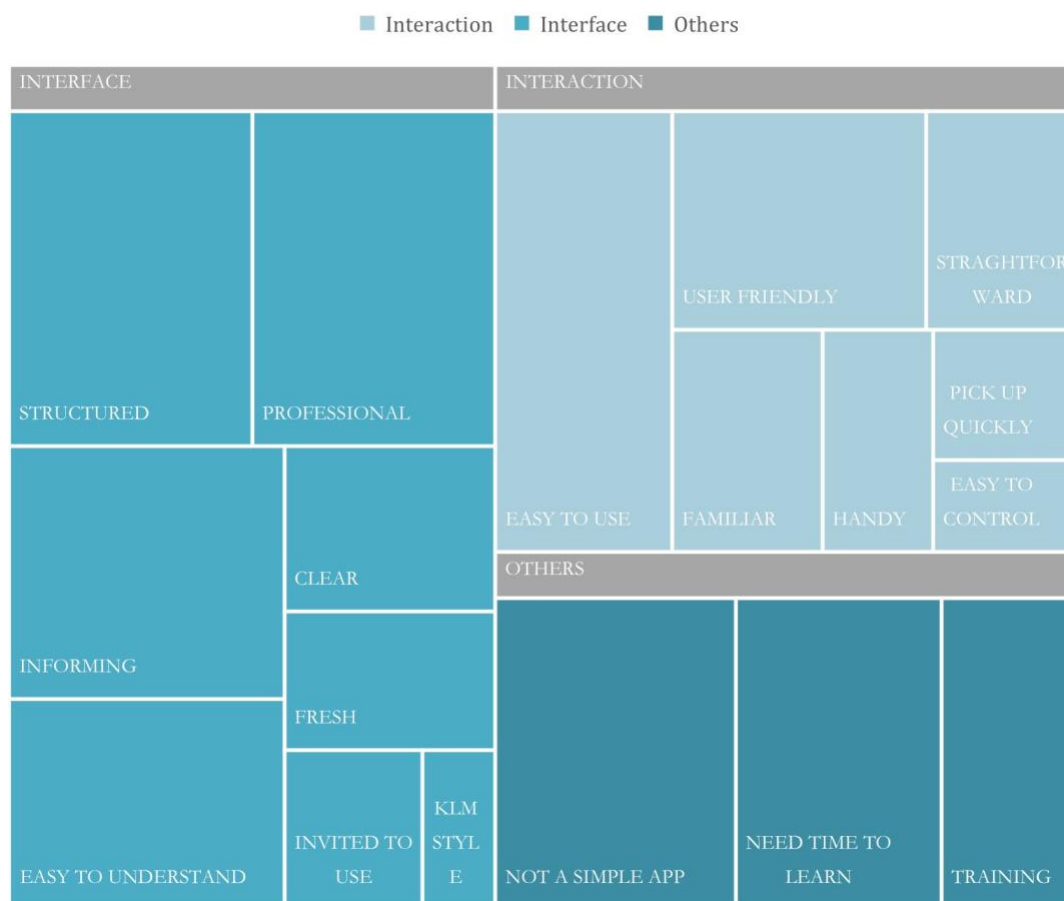


Chart 2. Prototype's UX Character



CLARITY OF SCREEN INFORMATION

In task 1, the participant is asked to explain the main screens, what the visual elements represent. Most had corrected and clear understandings of the visuals. They intuitively know meaning and functionality of the icon and figure.

“The symbol you used is very easy, I recognized because the app I am using now” (Deamer, 2018)

Although all the icons show labels which explain the functionality, a few participants did not understand the meanings immediately, but once they tapped on them and saw what came up,, they understood them.

“At this point, no. But I am sure it will be better with more tries.”(Planner, 2018)

PREFERENCE ON INTERFACE DESIGN

As I stated in the goal of test, I wanted to know the participant’s preferences on the color palette and header design in the Sub-functions (Holiday, Time off, and Flight request) of My Roster.

Same or different color as the theme color between Holiday and Time off

Only one person voted to have same theme color on Holiday and Time off, the rest of the participants thinking the color should be different.

“They are different things.”(Deamer, 2018)

“Time off is time off, you can spend it with so many different reasons, with family, and so on, and it is different with annual leave(holiday), because you are stay at home or somewhere nearby. But the holiday is different, it is just relaxed, your free time. Nothing about work at all.”(Planner, 2018)

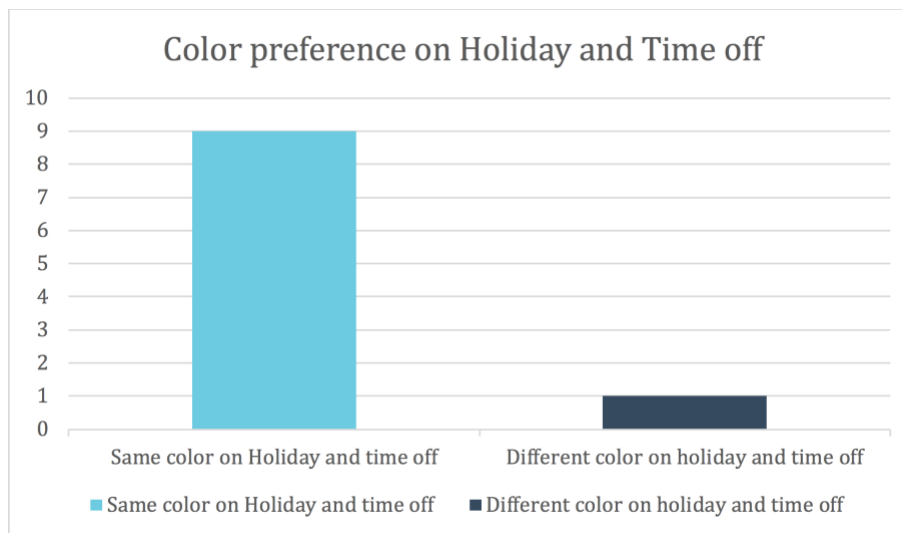


Chart 3. color preference on Holiday and Time off

722 SATISFACTION OF USE

To evaluate the Satisfaction of use, I use the System Usability Scale (SUS) and a pair of AttrakDiff surveys for comparison.

SYSTEM USABILITY SCALE RESULTS

Chart 4 shows each participant’s score. The SUS average score is 78.25. The average SUS score is 68 (Sauro, 2011), and if the results score above an 80.3, it will be the top 10% of scores. The result is not a level score, but it reaches my expectation. Not all the participants have seen or heard about this app prototype before they come to the test, and most of them are not technical people.

Also, I analyze the data with different combinations. First at all, individual scores of questions give a clear view of which part of the experience has problems. Secondly, dividing the data between personas reveals how the different groups of people adapt to the app.

Chart 5 shows the average score for each question to identify which part of the usability has a problem. The detailed data and surveys can be found in the Appendix, User testing.

- Easy to use: Question 3 is about ease of use, and it has the lowest score, 5.75/10. The results are conflicted with the participants’ impressions of the app. In the interviews, one characteristic of the app frequently reported was about the easy to use. In fact, during this survey, most participants shared the same view aspect on this question. They think it is not fair question in this current status, since it is the first time for them to see and touch the app. Negative feedback cannot avoided, because they will think it is not easy to use the first time, and they need time to play and learn it like everything else.
- Questions 8 and 9 also have low scores, both at 6.5/10. During the interview, I found out they are related. The reason is participants think they need to learn or play around with the app for a longer time only because it is a completely new format and system.

Both points support one thing: it is important to have a great support on how to use/adapt to the new system in the future, especially for the first-time users, because the new system is a huge transformation from multiple websites to one application on a mobile device. The



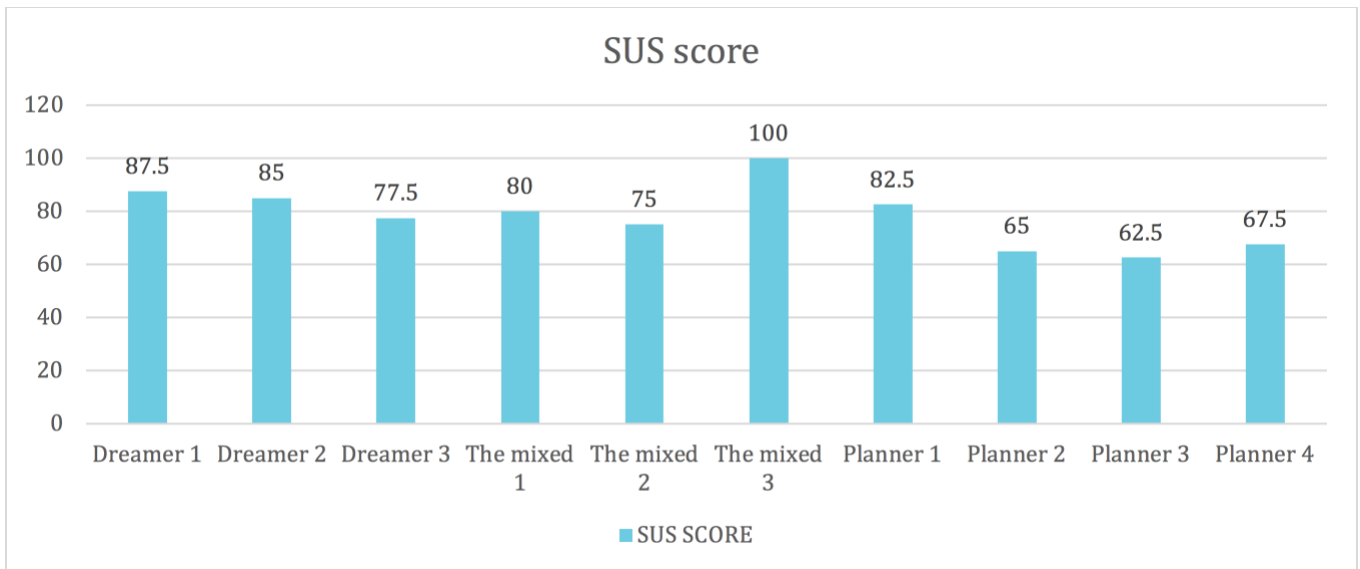


Chart 4. Participants' SUS score

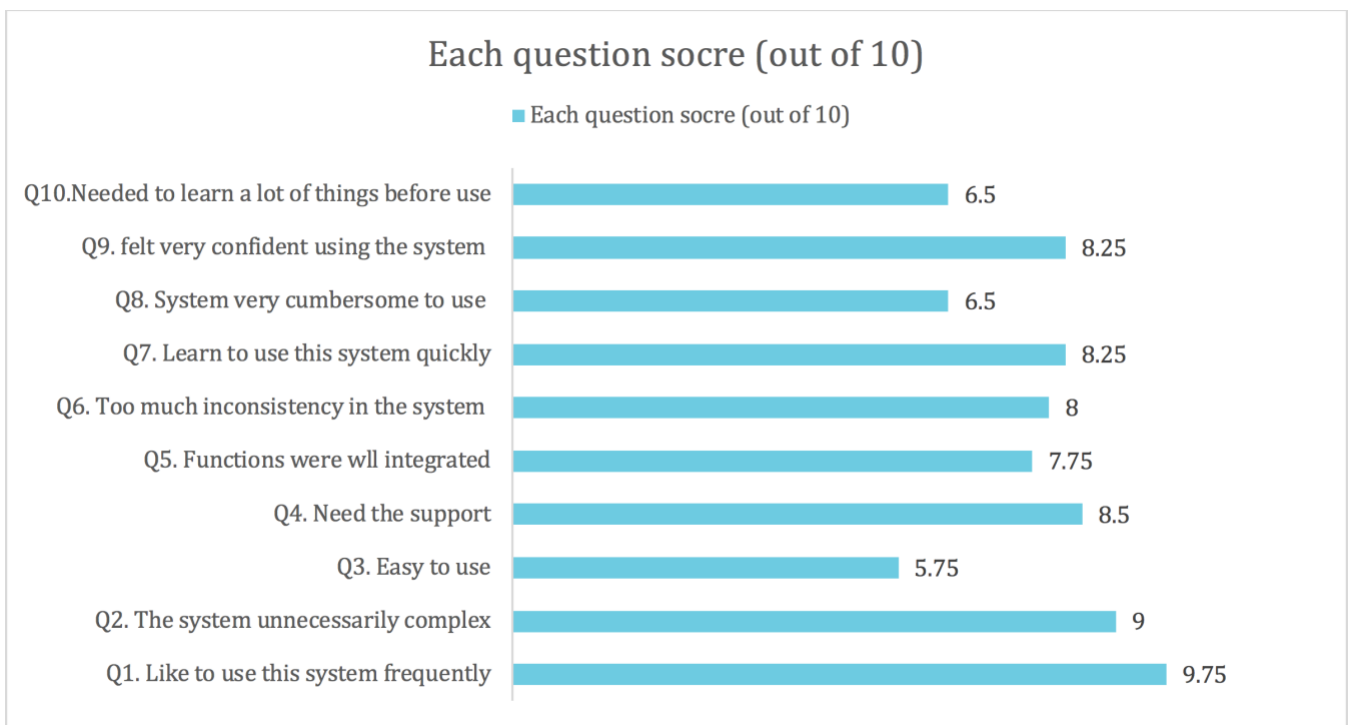


Chart 5. Each question score

interaction and experience are changed, and the changes need time and other support to enable the user to adapt to the new system and the new interface.

I also divide the average score among the three personas:

- The average of Dreamer: 83.3
- The average of The mixed: 85
- The average of Planner: 69.5

As you can tell from the averages, the planner has lowest score. When I went back to check their individual surveys, I found a pattern. All the planners provided negative feedback on question 4, with an average score of 4.4/10. During the interview, they also shared their concerns with me.

"It is not simple app, not all the people can learn this by themselves"

"it is hard to switch the mind set" (Planner, 2018)

In fact, it is not surprising to see the Planner has the lowest score on this survey. Most planners are the experienced cabin crew, and so they are very used to the current or older system. For them, the learning curve will be longer than for the rest of the crew members. Therefore, it is a necessary to provide different training for them.



ATTRAKDIFF RESULTS' COMPARISON

The AttrakDiff is the method for measuring the attractiveness of the product. And It measures the product in four dimensions: Pragmatic quality (PQ) , Hedonic Quality-Stimulation (HO-S) , Hedonic Quality-Identity (HQ-I) , and Attractiveness (ATT). Hedonic and pragmatic qualities are independent dimensions, and they contribute equally to the rating of attractiveness. (GmbH, Evaluation Report for Product "Demo - B", 2005) *

- *PQ: Describes the usability of a product and indicates how successfully users are in achieving their goals using the product.
- HQ-S: Mankind has an inherent need to develop and move forward. This dimension indicates to what extent the product can support those needs in terms of novel, interesting, and stimulating functions, contents, and interaction- and presentation-styles.
- HQ-I: Indicates to what extent the product allows the user to identify with it.
- ATT: Describes a global value of the product based on the quality perception. (GmbH, Evaluation Report for Product "Demo - B", 2005)

The participants complete two AttrakDiff surveys in the usertest. One is about the current system: Request system website, which is completed before the test, and the other is evaluating the prototype, which is completed after the test. The data of the two surveys will be presented as a comparison. The comparison shows in three ways: Portfolio of two systems, Average values, and Description of word pairs. (GmbH, 2013)

PORTFOLIO OF RESULTS

Figure 58 shows the portfolios or the character-regions of the Request system and the Crew Roster app prototype. The blue rectangle represents the Request system's portfolio results and orange rectangle shows the prototype's. The vertical axis and horizontal axis show the hedonic quality and pragmatic quality. As you can see, the Request system is more task-oriented and neutral. The prototype is the desired system to the participant. The prototype's pragmatic quality has high value, which means the product assists the user optimally, and hedonic quality also is high since it shows the user is stimulated by the product, and has clearly identified with it.

Moreover, the smaller size of the confidence rectangle shows more reliability and confidence coincident in the system. Therefore, the participant shows more variability in the evaluation ratings on the current system, and more certainty on the prototype.(GmbH, 2013)

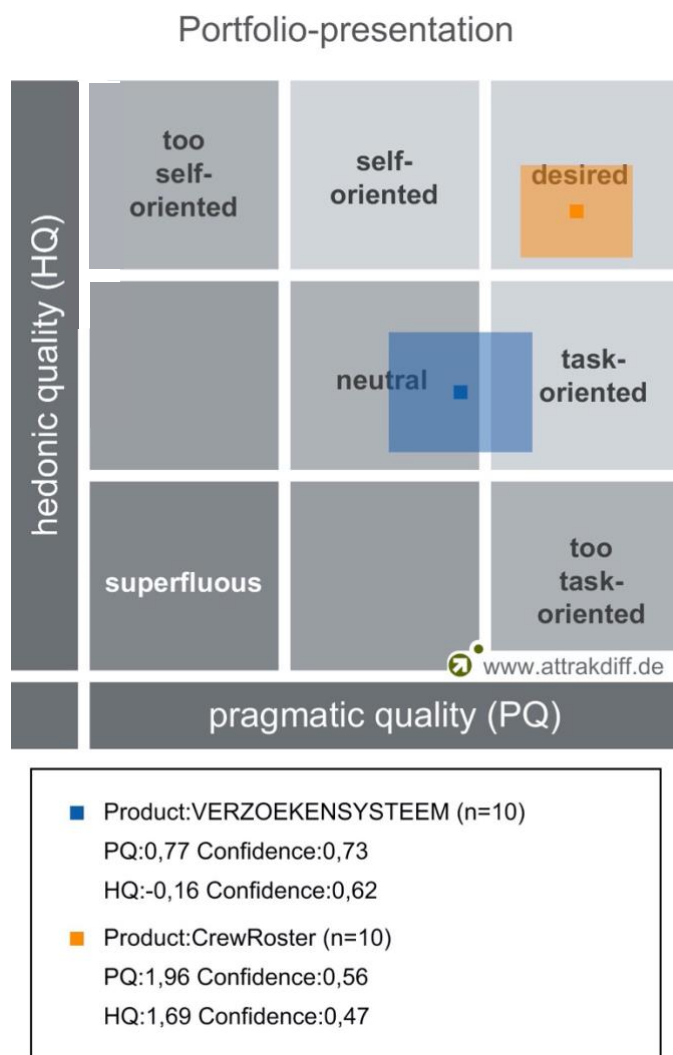


Figure 58. Portfolio of results

AVERAGE VALUE

In Figure 59, Diagram of average values, two evaluated systems are plotted. The Request system has the hedonic quality (both identify and stimulation) in the under-average region (0-1), which means the system did not bind the user to the product, and there is lack of motivation to use the system. Overall, the system is not attractive. On the other hand, the data of the prototype is more positive, and each quality's value is in the above-average region. The overall impression of the prototype is that it is very attractive to use.

However, both systems have lower values on HQ-S and HQ-I compared with the other two qualities. This relates to the system's purpose. The purpose of the roster system is to organize the work schedule, and it has a complex process and different regulations that underlie the operation. Therefore, it is not easy to bind and motivate users, unlike entertainment systems or game apps that attract users to use.

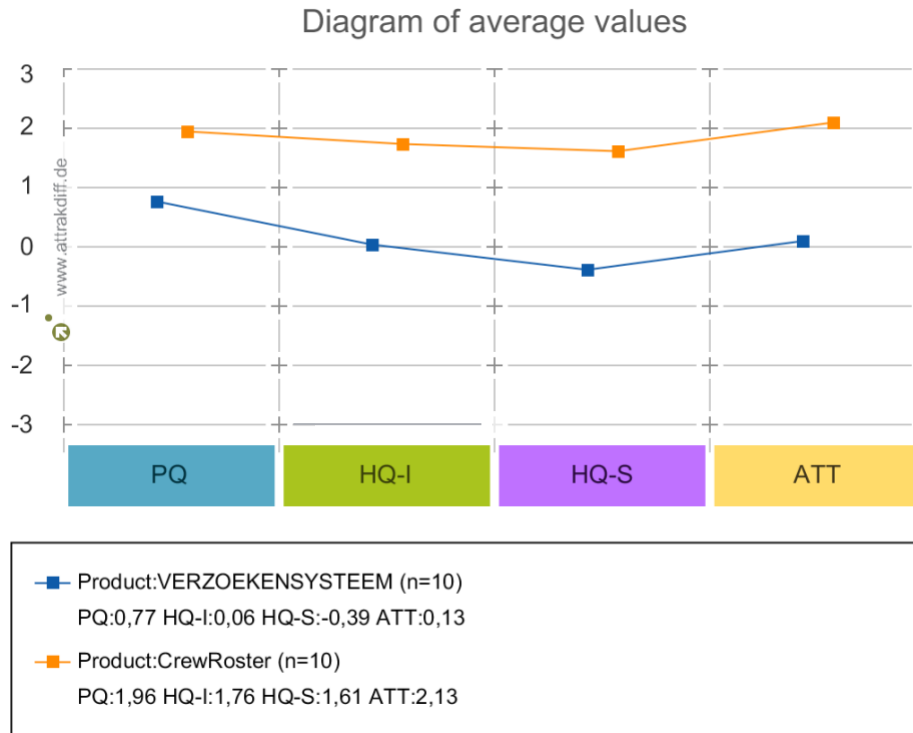


Figure 59. Average values

DESCRIPTION OF WORD PAIRS

Figure 60 shows the mean value on word pairs, and also shares the characteristics that are particularly negative or particularly positive. Overall, the prototype shows very positive results, every characteristics' mean value being in the above-average region except for two pairs, "cautious - bold" and "undemanding – challenging", which are on the average region.

- "Cautious - bold", the goal of new roster app is not to design something advanced, but to design something that enables users to do the roster by themselves. In fact, during the design, I added many elements that frequently appear in daily life because the user group of the prototype is not technical enthusiasts. As a matter of fact, it is the other way around, since most crew members are not experts in technical areas but are experts in human skills. Therefore, I designed the app interface and interaction in a more ordinary form instead of a bold design.
- "Undemanding – challenging", the result of this pair verifies with the SUS survey's result, which is that some participants think the app is easy to use and understand, while others think it is not a simple app, and they need time and training to adapt to it. Once again, how to help the crew to learn and transform them from old system to new app is a very important step.

Description of word - pairs

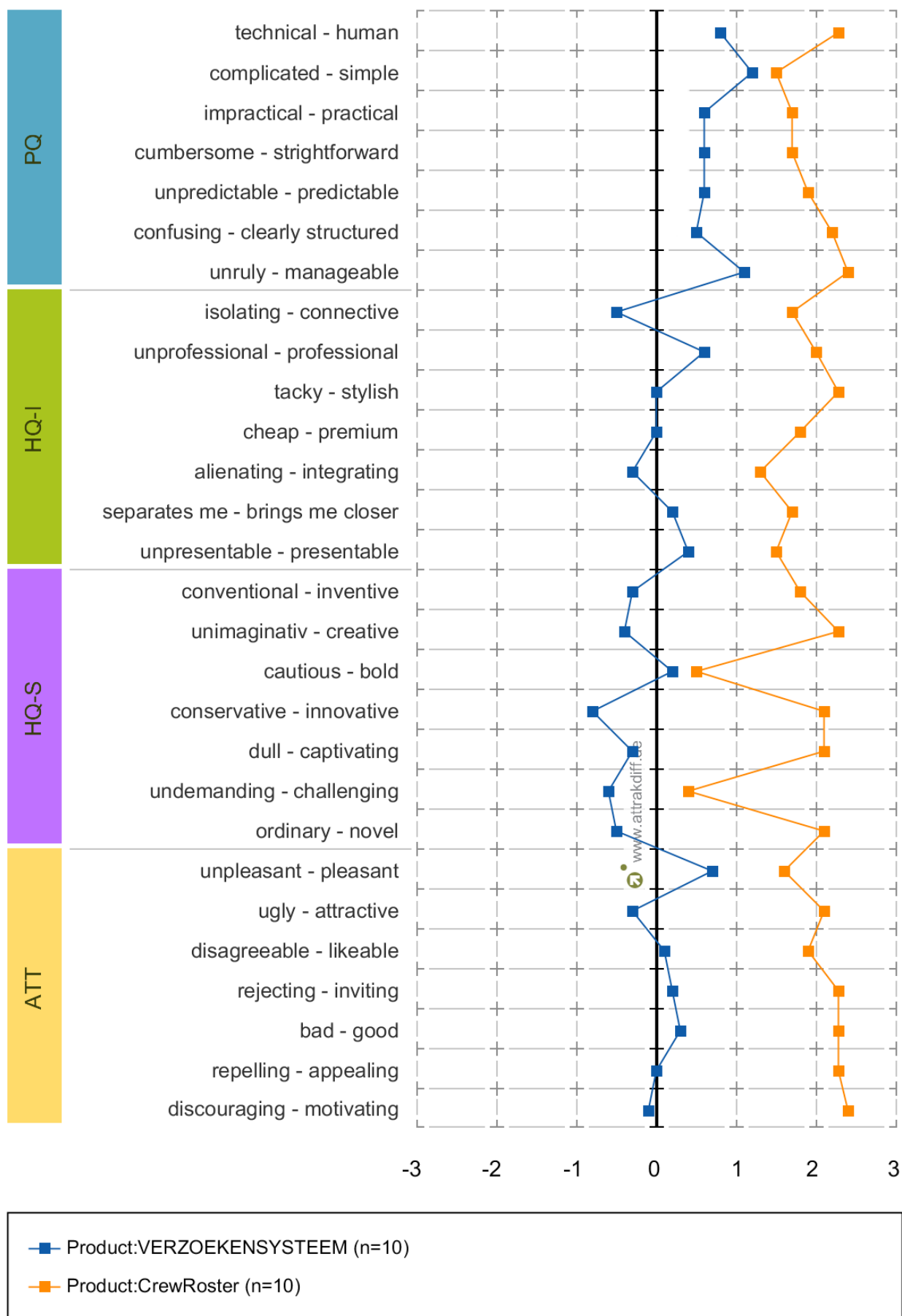


Figure 60. Description of word pairs

7.3 IMPROVEMENT

Regarding the results and other findings during the user test, I aim at improvement. In this section, I will list the improvements that I made after the usertests.

ADD INSTRUCTION MOOD IN ROSTER Q&A

From the results, the main concern about the app is how to learn it quickly, and get support when users need it. The function Roster Q&A supports the user in how to use the app and how to manage the roster in the whole experience via Q&A, tutorials, and manual. The live chat option with the P&A support team function is always on the sidebar. And to help the user, especial the first-time user, I created an instruction mood for the users. Once the mood is enabled, users will see the guided tour about the app, which is a short explanation for each function. This helps the user to review the functionality inside the app.

REMOVE THE RESERVE PREFERENCE IN MY PAGE

The reserve preference is an add-one feature, by which the system gives the crew a preferable flight when there are multi flight positions open during the reserve period. However, I found out that function may raise the crew's expectations and may fail to archive, because the reserve period is the standby period, and it is crew's duty to go to the flight when Crew control needs more crews on the flight. Therefore, cabin crew have to go whether he or she likes the flight or not. Once there is reserve preference in the app, it will give wrong message that the crew have options during the reserve period. So, the reserve preference is removed.

REDESIGN THE VISUAL REPRESENTS ON CALENDAR VIEW IN MY ROSTER

During the user testing, I asked the participants for their opinions on the interface, especially on the Calendar feature in My Roster, which is the main screen on the app.

- **More information on the screen**

The calendar view in prototype 1.5 is minimalism. It shows the basic information, what kind of day the crew has, whether the crew is on duty or off duty, whether it is safety training or a reserve period. To see Rest information, the user needs to tap the screen. So, the users cannot tell which flight they will have without tapping the screen. This is not convenient for the crew, because it is also important for them to know where they will go as the flight destination is primary information in crew wants, the same as their work route.

At the same time, I wanted to keep the simple and clear interface style. So, I added the destination on arrival/departure day with its abbreviation, which is what the professional and regular term crew use in their daily work.

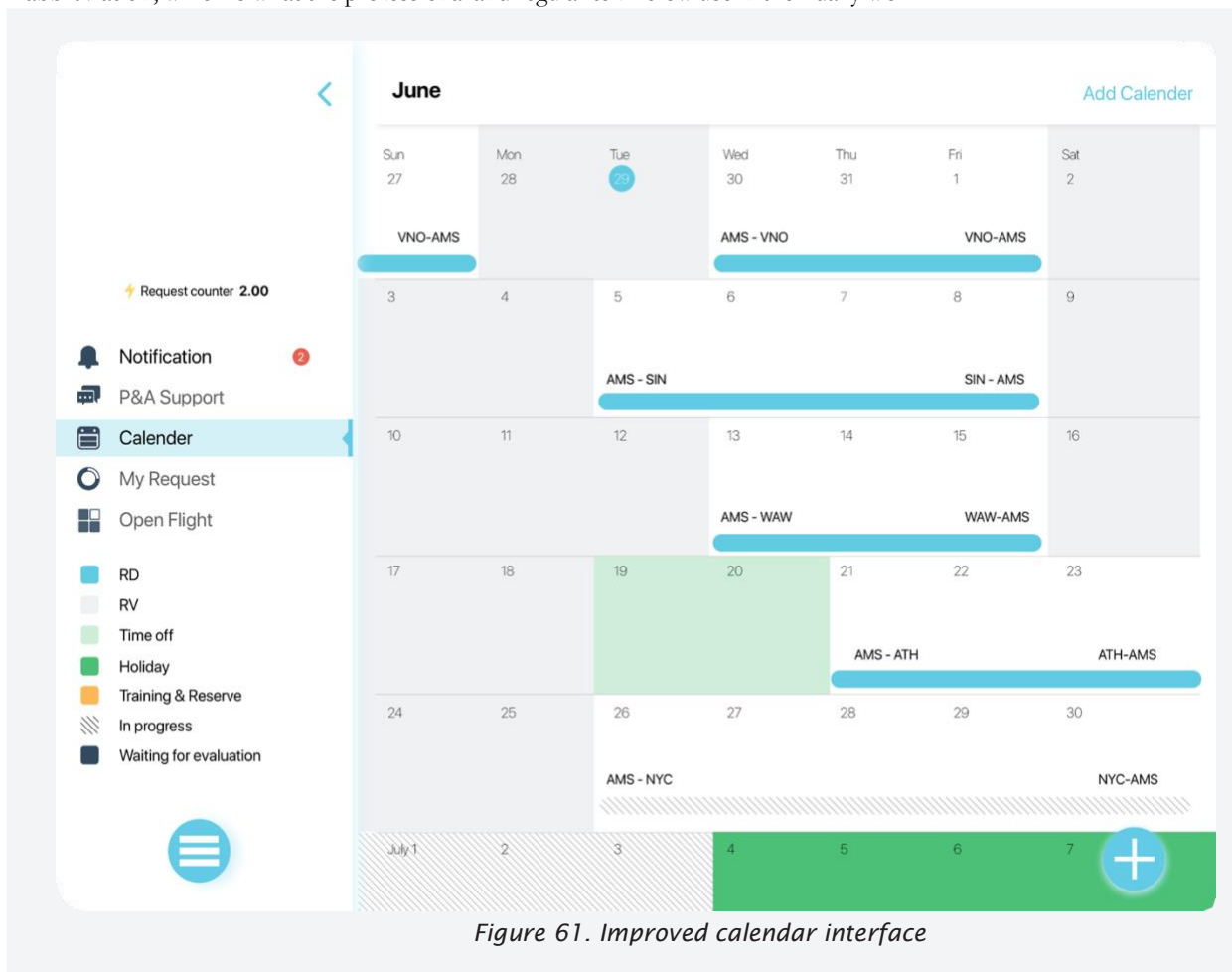


Figure 61. Improved calendar interface

- **New color palette and new legend**

In the beginning, I wanted to make a clear distinction between different days, so I used desaturated complementary colors (see figure 62), but also to give clearer and settle color palette (see figure 63).

- Time off and Holiday: I chose to use similar green color on Time off and Holiday, but there are clear distinguishing characteristics between the colors of Time off and Holiday. Although both are day off, the result shows crew has very strong and clear opinions that Time off and Holiday are two different things, and they don't want to group them into one thing. Therefore, I chose the stronger and darker green for Holiday because it is a longer vacation, and lighter green for Time off.
- Waiting for evaluation: the old design is a simple white bar with dark grey outline, which is not conspicuous in the calendar view. In the test, most crew did not notice it at all; therefore, I chose a dark blue which is same color I used for sidebar feature's icon.
- Use the professional term: in the new legend, I chose to use the professional terms RD and RV. Redesign "Open Flight" icon

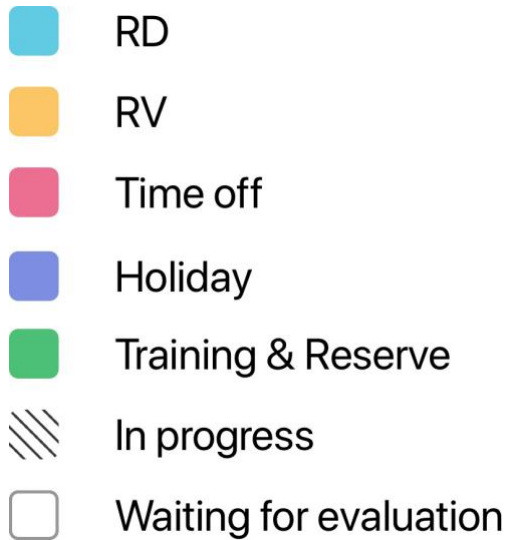


Figure 62. Legend in Prototype 1.5

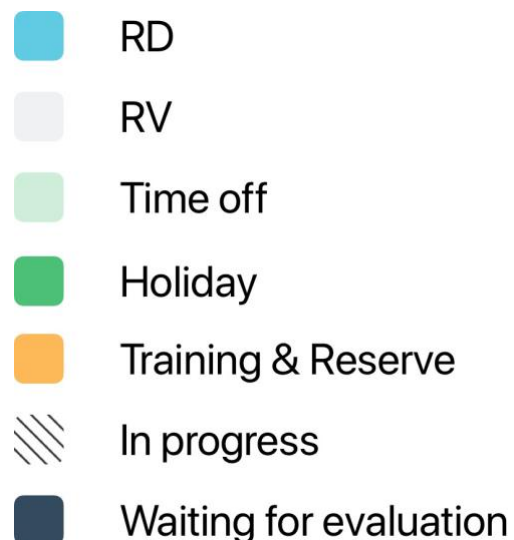


Figure 63. Legend in Prototype 1.5

- **Redesign "Open Flight" icon**

During the user test: I notice the Open Flight icon is not recognizable comparing with the other icons. As a matter of fact, "of" means "or" in Dutch, so the icon may even send the wrong message to the user. I designed a new icon, which has three solid squares, and one outline square which implies the open position in the flight.



Figure 64. Improved Open Flight icon



Figure 65. Open Flight icon in Prototype 1.5

- **Replace the request information to have a real-time assessment during flight request feature**

Prototype 1.5 gives a request information to the crew. It is a report that provides the crew with brief information and impressions about other requests on the day. It should help the crew to request the flights with transparent information. However, during the user test, I notice it may too technical or written form for crew.

In the newly request information, it will give the user during the request. And information will be real-time reacted based on the user's inputs. Information mainly will be related to the request granted probability, or warning about flight safety and so on. By giving real-time information during the request process, it helps the crew get information more directly and interactively.



74 SUMMARY

STRENGTHS

- User friendly: the participants agree that the interaction and app format are user friendly to them, that they can easily figure out how to interact with the interface;
- Affordance interface and interaction: the navigation of the app is clear and easy to pick up;
- High tolerance: user can always go back to last screen and undo their decisions;
- Grip on the roster and day off: the combination of functions in the app helps crew to get a grip their roster and balance their work and personal life.

LIMITATIONS

- Concept interactive prototype: the prototype is not fully functional, which affects the user during the testing;
- Small testing group: there were not enough people to test an app that services 10,000 users.

The results of the user testing are positive. The design shows above-average quality in Effectiveness of usability and high quality in Satisfaction of use. Especially, in the results of AttrakDiff, it shows that the prototype is a very attractive system to user. Although the participant group is not big, the number of participants is enough to show the consistent preferences which reveal tendencies of the design. Also, the participants shared very useful feedback and experience which helped me to improve the design. With several rounds of iteration and the final user test, I am ready to present my final design concept.



Chapter 8.

FINAL DESIGN: CREWROSTER APP

In previous chapters, I introduced the research and design process in this project. This chapter presents the future crew roster system (CrewRoster). First, the roster process and the new function flow of the app will be shared, as they are the foundation and frame of the system, followed by the future user journey map. Second, the main screens and main functions will be presented and explained.

8.1 ROSTER PROCESS

The roster process remains the same as shown in Figure 49. During the expert review, the roster process was already discussed and agreed with the P&A team after several meetings. There were no disagreements or negative feedback about the roster process during the user test.

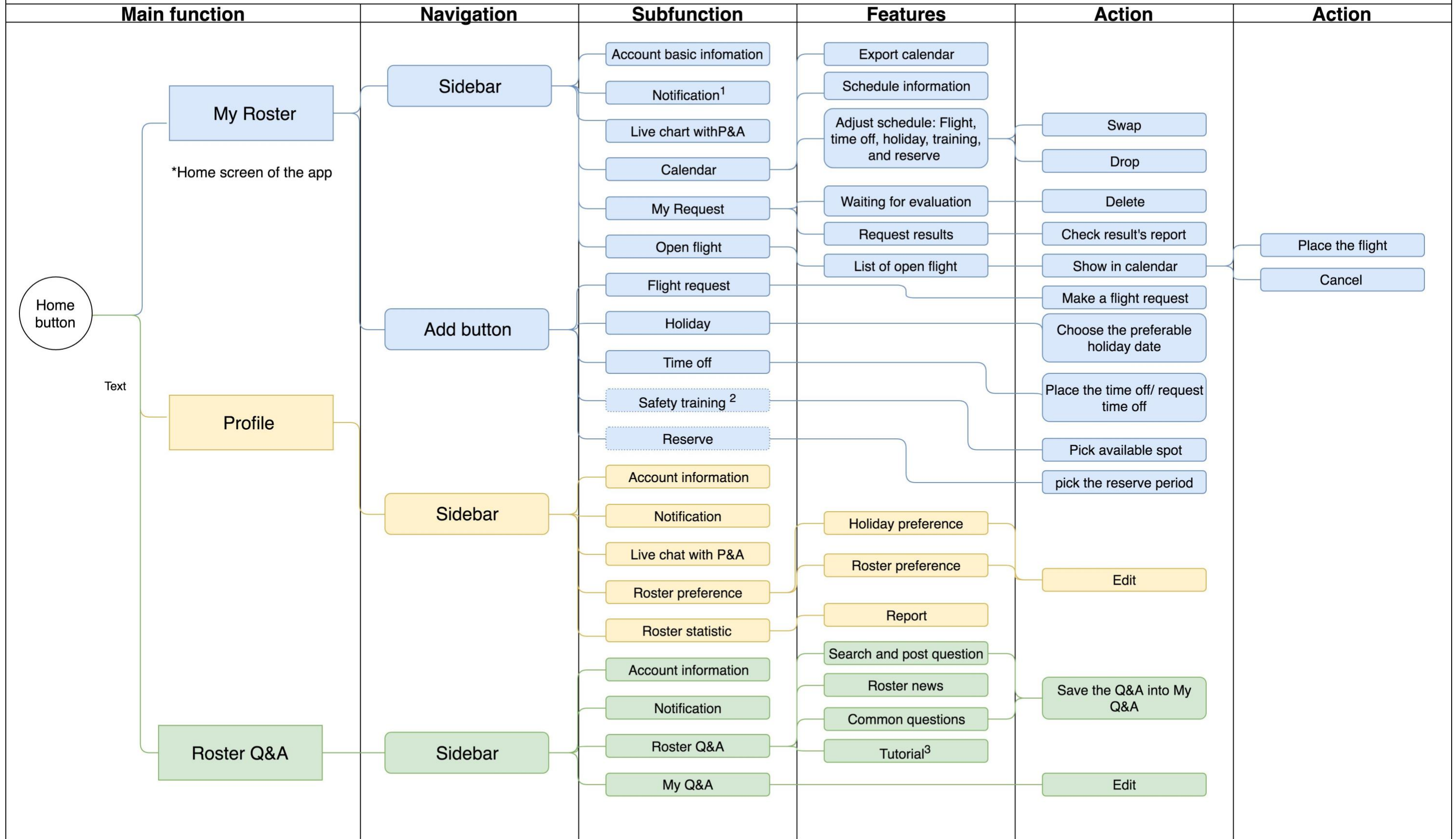
8.2 FUNCTION FLOW

Figure 69 shows the function flow of the CrewRoster app. It shows different layers of the app and features inside the app, from the main function to actions. As stated, the function flow is wide but shallow. The purpose of this design is to enable the user quickly to access the functions and understand where they are in the app.

In the app CrewRoster, there are three main functions: My Roster, Profile, and Roster Q&A.

- My Roster (Blue area), the home screen of the app, shows the roster information, and users will manage their roster with this function.
- Profile (Yellow area) is the setting function. The user's account information and roster statistics (account report) will be present here. In the roster preferences feature, the user inputs their information and shares it with the back-end roster system. Based on this information, the back-end system can optimize the roster regarding crew's preferences.
- Roster Q&A (Green area) is the function when the user has a question related to the roster.

CrewRoster function flow



Footnote:

1. Notification and Live chat function are the two functions that always show on the sidebar.
 2. Safety training and reserve functions only show when the crew need to do the duties

3. Tutorial is the online only feature in the system, because it contain video and manual which need huge storage space

Figure 69. Improved function flow



8.3 FUTURE USER JOURNEY MAP

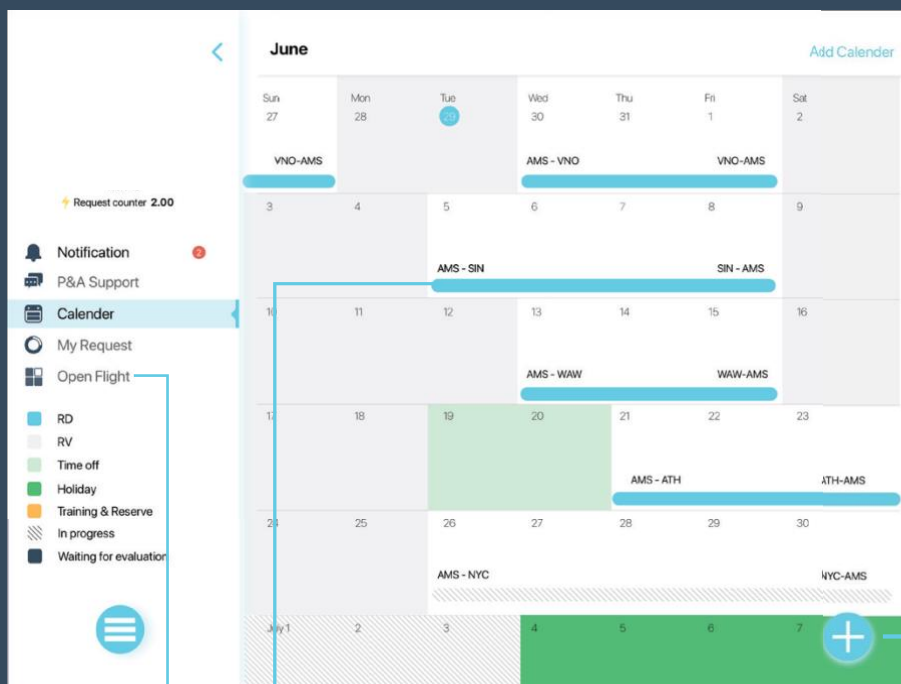
The Future User journey map (not included) shows how the experienced user will use the new app to manage their roster. The order, left to right, is based on the roster process, which presents the steps during the self-rostering. For each step, the user's goals for each period are shown. The interactions between back and front-end systems, and the customer actions, are then linked with steps. Also, the emotions of the user during the whole experience are plotted. The last part is the touch point of the journey.

8.4 INTERFACE AND FUNCTIONS

There are three types of function in the app to help people balance their work and personal life: Manage roster, Plan the day off and Set the profile. Manage the roster user uses this kind of function to adjust the roster via swapping, dropping and picking the flights or other events. Plan the day off enables crew to grip on their day off so they can integrate their work schedule with their personal agenda. Set the profile enables the back-end system to optimize the roster with the crew's needs and wants. See page 82-84.

Interface and Function

Home screen



Insert Personal agenda

Account information

Subfunction in My Roster

Calendar Legend

My Roster function

Manage roster

Adjust the roster
Flight request



Open Flight

Pick the flight

The Open Flight function shows all the open position that the user is qualified to flight



Flight Request

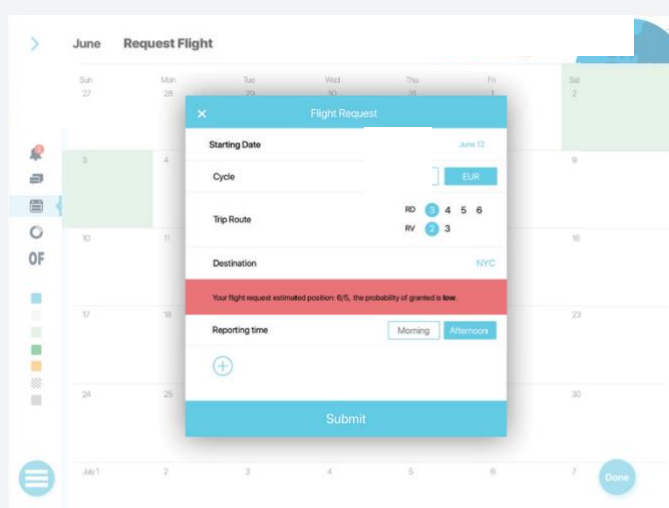
Customized flight request with real-time information

The Flight Request in the app is customized, the user can make their flight request based on their demands. The system helps the user while he or she is requesting by giving the request position and probability.



Swap and Drop the flight

User can manage their roster via swapping with system or with other crew, dropping the flight



Plan day off

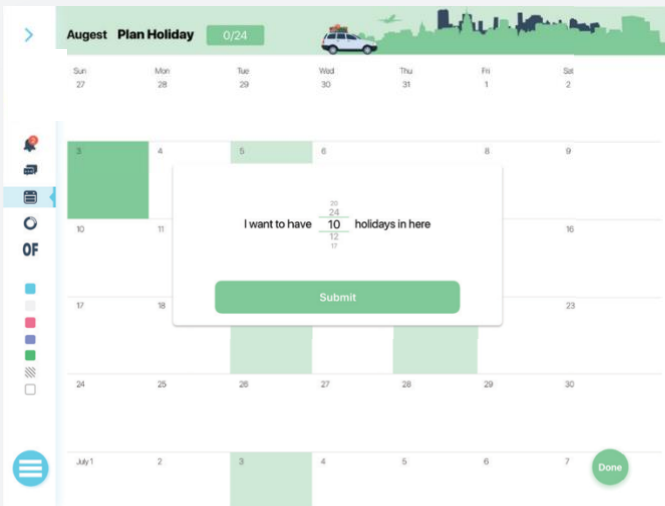
Plan holidays
Plan time off



Plan Holiday

Real-time assessment

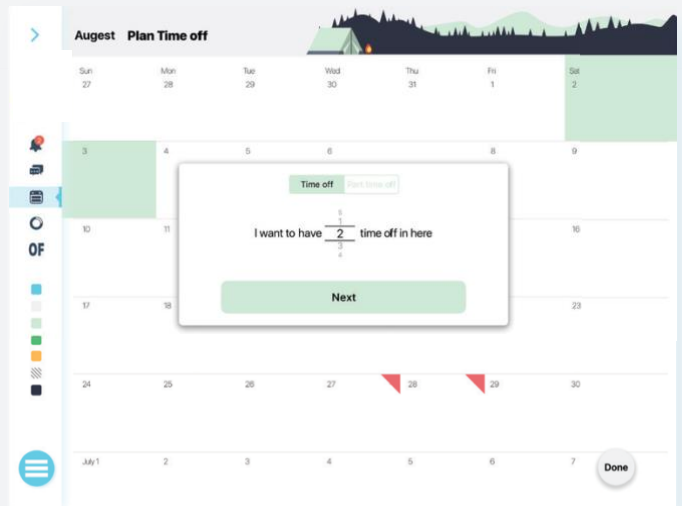
Regarding the user's holiday preference, the app shows the possible starting dates to the user. And the user can pick their preferable starting date, and how many days they want in the row. And the holiday granted immediately.



Plan Time off

Real-time assessment + Weekly evaluation

The user can apply their time off via FlyCo account or Crew account. By using FlyCo account, the user has to wait for the evaluation to see if their request granted or not. By using Crew counter, the user can get their time off immediately after real-time assessment.



Need support

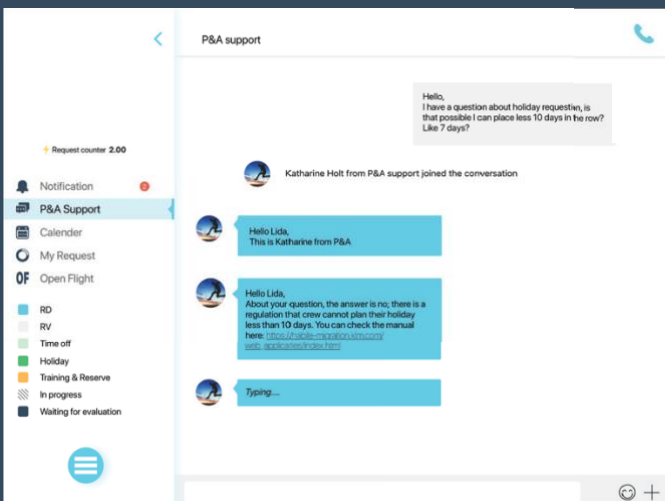
Live chat with P&A support
Roster Q&A



Live chat with P&A support

24/7 support in the app

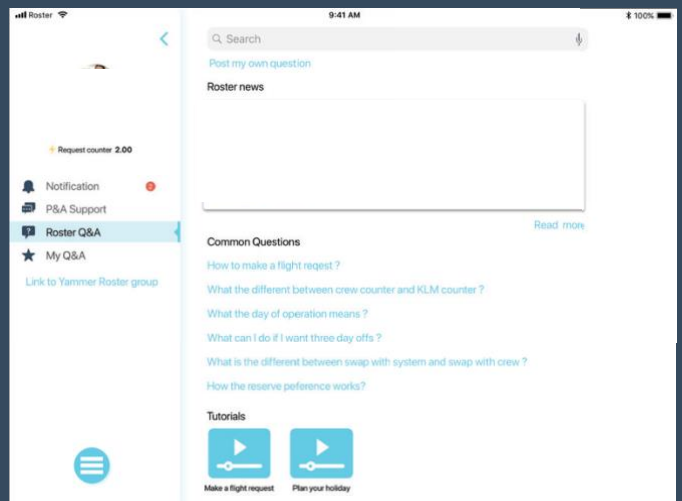
By providing the live chat function, the user can get 24/7 support. Also, the right corner, you can find the support team's office phone number. The Live chat function always stays on the sidebar, and the user can easily access it.



Roster Q&A

24/7 support in the app

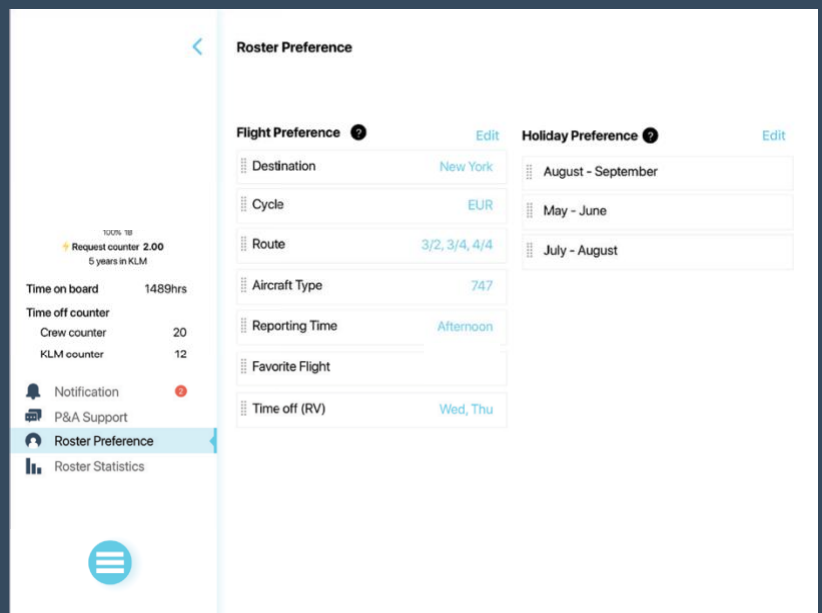
In the function Roster Q&A, the user can search/post question, and read roster news from P&A, check the common question ad tutorial.



Set the Profile

Set the Roster Profile, let the system optimize the roster for user

The user can set their flight preference and holiday preference in the app for back-end system optimizing the roster. Also In the function Roster Statistics, it is reported that shares the user's account information, and annual flight request status.



8.4 LIMITATION

A REMEDIATION IS NEEDED FOR THE TOPIC

The regulation and rule are complexed and massive in FlyCo roster system. Learning this knowledge took me a lot of time and energy. Especially, my topic related with the system which mean I also learn how the different system, app works in the FlyCo. And with the time limited, it is hard to understand all the regulations and system.

A BIGGER QUANTITATIVE USE TEST IS NEEDED

Although there are 17 participants joined the expert review, and 10 participants were involved the user test. The results show some tendency, but with 10,000 crew members as the user group, it is not validated result. Consequently, to validate the usability of Crew roster app, more in-depth and larger quantitative research with larger participants group is needed.

Chapter 9. CONCLUSION

9.1 PROJECT CONCLUSION

9.1 Project conclusion

The goal of this project is to explore the crew's needs and wants, and to design a future crew roster system concept based on the findings. The project is not just a design project but is also a small research project. FlyCo already has a mature rostering system and process which has run for years. However, the technical end phase of the back-end system forces the P&A department to look for a new system. This thesis project helps the P&A department to understand the needs and wants of their user, the cabin crew, related to the roster.

First, the results of the research phase indicate that there is a gap between P&A staff and Crew on the roster topic. P&A staff think about the roster from technical, operating, and steering perspectives. Each unit of P&A is controlling a specific period of the rostering, and they do not know the crew's whole range of experience. They think the roster is just a small part of crew's life, something that involves the crew only once a week, or even less. However, from the crew's perspective, it is a different story. Most crew think the roster determines their life. To them, the roster is not just a work agenda, but it decides how they will live in the following weeks and months. For the crew, it relates to their family and their friends. For the part-time crew especially, it also affects their second job. Therefore, most of them spend time every day to see if they can get the ideal roster or not, since they need to balance their personal life and work via roster.

Second, the usability of the current system, and managing different systems, are a problem to the crew. There are too many FlyCo apps and systems that crew need to learn and use. Moreover, some apps and systems link to different back-end systems, which causes inconsistency in the information due to delayed updates in the back-end. Each roster system is an individual system, which means users have to manage them individually, and find their own way to combine the information into one. Also, the research shows the

low usability of the current system, with crews having difficulties and unmet needs related to usage. This is also related to the different crew groups in FlyCo. The persona study shows that each type of crew has different needs and wants, strengths and weaknesses. But the current system does not offer personalized options. The system is not customizable for each user, but instead the system asks the crew to learn and become used to its format.

The design of the future crew roster system started from the findings of the research period. It went through the ideation, iteration and final user test to final design. The ideation is focused on choosing the concept to continue on the project. The iteration in this project is to see the possibility of the concept with experts in FlyCo. During iteration, the design moves from wireframe to prototype, from idea to concept design. After the expert reviews in iteration, the testable interactive prototype is ready for users to evaluate. In the user testing, the details and usability were evaluated by users, and the results were satisfactory. The usability of the prototype is high quality, although with some improvements to work on. Eventually, the final design is ready to present.



9.2 RECOMMENDATION FOR FURTHER RESEARCH AND DESIGN

Related to limitations of the project which were presented in the previous chapter, recommendations for further research and design include the following points:

MULTI PERSONAS IN THE USER GROUP

The most challenging issue in the project is how to satisfy different types of user in the group. The very large number of the user group indicates that each group has certain people that we cannot ignore. Therefore, it is important to keep in mind during the further design that there are different needs and wants from crew groups.

HAVE A GOOD TESTING ENVIRONMENT AND PARTICIPANT

Before launching a new application, a test is needed.

- Build a standard for user testing
Usability is hard to test, and sometimes the participant could be subjected or influenced by others. To make the user test scientific, the results should be validated.
- Due to the various types of cabin crew requests, the test's participants should also be diverse in order to provide an understanding of how each group crew reacts to the new app.
- Sufficient test duration The testing should take place for at least one month, to enable the participants to encounter different situations during the usage.

WALK WITH CREW DURING THE LEARNING CURVE

It is essential to the user and P&A that the transition from the old system to the new one is smooth, so thoughtful support should be applied.

- Introduction workshop with crews
In the Persona study, there are different types of user

in each user group. Also, each group has their own weaknesses and strengths, so it is important that each group of people receives the training that they need.

- Tutorial movie and manual
It will be beneficial to have both digital and physical guidance for users. A tutorial movie could give a direct and straightforward introduction, and a manual will support the user with more detailed information.



9.3 PERSONAL REFLECTION

This project has been such a journey, and it was a great learning experience and opportunity. In the beginning, I did not follow a general design process, but instead I formulated my own process that seemed to fit this project best. The whole experience was challenging, especially as I worked alone with limited time available for a project of huge scope. This forced me to do more and out of my comfort zone. I started from scratch, to understand what roster means, and how the roster works in FlyCo. The project let me explore and discover so much. From learning the C-app and iCrew system, roster process, and regulations, exploring the usage of the current crew roster system, hosting several creative sessions, dealing with 2,000 replies to my survey, interviewing cabin crew, P&A staff, other FlyCo ground staff and user research to find out crew's needs and wants, producing a design criterion, conducting prototype iteration with experts and finally performing user testing with a user group, all the above activities and their findings helped me to finalize the final design.

The starting of the project was hard. Before going to user research, I wanted to understand the current system. But the FlyCo roster system is more complex and challenging than I expected. It involved with four units, five systems, one F&Q website and a huge number of users. But this process could not be avoided, because I wanted to identify the strengths and weaknesses of the current system before I explored the new concept. At the same time, it is hard to find literature about roster system design, since most articles are about the mathematics of roster. Moreover, a crew roster system is an internal system which outsiders cannot get information about. So, I shifted my direction and spent more time on exploring the usability of the current system. If I had more time and connections, I wanted to explore other airline's crew roster apps, to see how they solve the problems. I think I missed a benchmark in this project, since it is hard to know the product position without comparisons. But

fortunately, because it is an internal system, the product position does not affect this project too much.

The ideation of a concept is not easy, especially the creative session, which is hard to host. It is difficult to find people who have knowledge of both the FlyCo roster and UI design. But with the findings and design criteria, I was able to frame the design concept. To design a system that fits user's demands is the core of this project, and their overall demand is to balance their work life and personal life. To accomplish that demand, they need to have a grip on the roster and day off. From the FlyCo P&A department perspective, they want crew who can self-roster in order to reduce their workload. To satisfy these requirements, the future crew roster system has to be structured to provide the user's customized freedom. In the design concept, the roster process behind the interface is structured, via notification, and the system reminds users how to go through the process. Through the functions, such as swapping, it enables crew to manage their schedule without affecting the whole roster operation. And by setting the roster profile, the back-end system can recognize the individual user and know their needs and wants.

It is good that P&A realized their need for an interaction designer to find out user's needs and wants before they developed a new crew roster system. The project stops at the concept level, and it is a user-centre design project. I tried to balance the needs and wants between FlyCo and the crew, but the concept may still lack some of FlyCo's perspective. I hope P&A will put more resources and people into research and design for it. And I hope the results of project can guide/help P&A in the further research and design.

REFERENCE

- 100% 1 stripe, f. (2018, March). Crew interview. (J. Liu, Interviewer)
- 80% 2 stripe, f. (2018, March). Crew interview. (J. Liu, Interviewer)
- Boeijen, A., Daalhuizen, J. Z., Schoor-Rombouts, R., Zijlstra, Y., & Kunttonen, J. (2010). Basic Design Cycle is a model that represents the trial-and-error process of design.”. In Delft design guide (pp. 19-20). Delft : TU Delft .
- Dam, R., & Siang, T. (2018, June). Personas - A simple introduction. Retrieved from Interaction Design Foundation : <https://www.interaction-design.org/literature/article/personas-why-and-how-you-should-use-them>
- Kohl, N., & Karish, S. (2004). Airline Crew Rostering: Problem Types, Modeling and Optimization. *Annals of Operations Research* ,223-257.
- crew, C. (2018, May-June). Expert review during iteration period . (J. Liu, Interviewer)
- crew, C. (2018, April 11). Group session . (J. Liu, & Y. Lai, Interviewers)
- Deamer. (2018, July). User test of prototype 1.5. (J. Liu, Interviewer)
- GmbH, U.I. (2005, December 10). Evaluation Report for Product “Demo - B”. Retrieved from AttrakDiff: http://www.attrakdiff.de/files/demoproject_results.pdf
- GmbH, U.I. (2013). Retrieved from AttrakDiff: <http://www.attrakdiff.de/index-en.html#tab-vergleich-ab>
- Lewis, J. R., & Sauro, J. (2012). The Factor Structure of the System Usability Scale. Retrieved from https://measuringu.com/wp-content/uploads/2017/07/Lewis_Sauro_HCII2009.pdf
- Planner. (2018, July). User test of prototype 1.5. (J. Liu, Interviewer)
- Sauro, J. (2011, February 2). Measuring usability with the system usability scale(SUS). Retrieved from MeasuringU: <https://measuringu.com/sus/>
- Vermeeren, A. (2017, 03 02). Measuring UX and usability . Faculty of Industrial Design Engineering, TU Delft .
- Wroblewski, L. (2012, November 2). Responsive Navigation: Optimizing for Touch Across Devices. Retrieved from LukeW Ideaiton + Design: <https://www.lukew.com/ff/entry.asp?1649>



