

# Development of a Mobile Customer Application for Dry Cleaning Services

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## II. ABSTRACT

While machines are getting better at simulating human behavior it has become more common with the use of avatars and conversational text in mobile applications. These are used in order to induce a reflectively positive experience for the user, possibly making the user choose that application in favor of another. The balance between developing a too playful application and an uninteresting one is hard to achieve. This master thesis project aimed to do exactly that while developing a customer application for dry cleaning services in the U.S. By using an incremental and iterative agile software development method for a single person project, project goals and deadlines were met. This thesis researched use of personality in modern mobile applications while developing the application for Apple's iOS using the Swift programming language. After research and development, a usability test was conducted in order to evaluate application design, use of avatar and conversational text as well as navigation and transitions. The avatar was labeled as too disturbing for the users while the conversational text enhanced the user experience. The project resulted in a finished prototype for ordering dry cleaning without the avatar. The use of more refined avatars in applications like this might still be feasible. Users demand a delightful experience from their applications and it is extremely important for developers to listen to this demand. If not, users could be lost to rivals.

**Keywords** - iOS, Personality, microcopy, avatars, dry cleaning, USA

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### III. INTRODUCTION

A quote by Donald Norman from his book *The Design of Future Things* states as follows: *"Some machines are obstinate. Others are temperamental. Some are delicate, some rugged. We commonly apply human attributes to our machines, and often these terms are fittingly descriptive, even though we use them as metaphors or similes. The new kinds of intelligent machines, however, are autonomous or semiautonomous: they create their own assessments, make their own decisions. They no longer need people to authorize their actions. As a result, these descriptions no longer are metaphors - they have become legitimate characterizations."* [1, p. 36].

People are constantly interacting with applications, some have become civilized enough to respond to the user in a human sense. How will a user think of an application when it is simulating human behavior? When the user gains a relation to the application and think of it as something more than just a machine, will this evoke the user to try to please it or will it be a disturbance to everyday use of the application? More importantly, does human behavior in an application create a positive experience for the user?

Mobile applications are being used all the time, everywhere. Some apps are using funny sayings and nonsense information while others are bringing back avatar assistants in a completely new way, see figure 1. Developers are infusing human behavior in their applications, inducing emotional reactions from users to enhance the user experience.

#### A. Goal

To keep up with competitors, developers need to create amusing user experiences in order to intrigue users to use their products. Playfulness is an ever more important aspect of user experience even in contexts other than games. For this thesis the following goals have been defined.

- 1) Investigate how personality could enhance user experience
- 2) Define a personality suitable for the context of ordering dry cleaning
- 3) Develop a mobile application for making dry cleaning services available on a smartphone.
- 4) Integrate the personality into the application and test its usability and user experience.

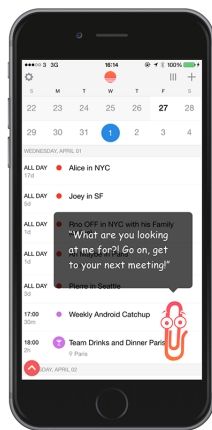


Figure 1. Clippy, the famous paperclip avatar assistant has returned [2].

## IV. BACKGROUND

This thesis was conducted at a Swedish startup tech company that helps provide a complete solution for dry cleaners in the United States. The company is working in collaboration with a tech company in San Francisco with tight association to the dry cleaning business.

### A. San Francisco area

The area of San Francisco consisted of roughly 3500 startup companies back in 2012 [3], the outer parts including the notorious Silicon Valley is the home to major tech companies like Facebook, Google and Apple. San Francisco was by the National Venture Capital Association ranked as the number one top city for startup companies, based on dollars invested in young tech companies in 2011. With a rich culture of starting new companies or offices in San Francisco there has been a growing need for dry cleaners in the area, business people attend meetings in expensive clothing that needs extra care when washed.

### B. Dry cleaning services in the U.S.

The dry cleaning and laundry industry is very widespread in the U.S. with over 30000 companies that brought in about 10 billion dollars in revenue in 2014 [4]. About 70% of the revenue were from retail laundry and dry cleaning operations - 30% were pure laundry locations. Expensive equipment is typical for the dry cleaning business where smaller independent businesses often have trouble affording these. Thus, owning a franchise is a way to afford the expensive equipment, easier comply with government regulations and be more efficient by cleaning laundry at a centralized facility. Another way of expansion is through home delivery which has become increasingly popular [4].

### C. The San Francisco based tech company

A startup company that is hereby referred to as *The Startup*, helps the tech company in San Francisco to provide a solution for dry cleaners including several integrated systems. Their name is not revealed in this report for secrecy reasons. The following are short descriptions of some of them.

1) *Point of sale and inventory system*: The business offers flexible payment methods via desktop or mobile, in store or on the road while keeping track of all customer-submitted clothing.

2) *Delivery system*: For dry cleaners offering home delivery there is a system for keeping track of deliveries, drivers and vehicles. It also shows route statistics and performance.

3) *Workforce management system*: By reviewing productivity, performance and timeclocks using data reports, management can track entire production facility by time, station, or employee.

4) *Accounting system*: Management is able to get summaries or detailed reports on profit and loss, sales and production, payroll and more.

5) *Mobile ordering system for customers*: When a customer feels the need to get a pickup for dry cleaning or set weekly appointments they should only have to use a simple mobile app. This system is currently only for Android and still under development. This thesis will focus on defining and integrating personality into this customer application and implementing it for iOS.

### D. Demand for home delivery

In today's modern society traditional shopping of products and services are hit by the economic crisis and the competition of internet shops according to Visser, Nemoto and Browne [5]. Older people discover the convenience of internet shopping and younger people are so used to the Internet that remote ordering from home or on the go comes natural to them. It is very likely

that purchases made online will only increase further - making home deliveries crucial to the survival of businesses in the future.

## V. THEORY

This thesis has taken into account design principles in order to incorporate emotional design in an application for everyday use. Analysis of some academic articles on playfulness in an everyday reality and avatars was of great use in addition to professor Donald Norman's principles. Finally a blog post on defining and incorporating the brand voice of a company into an application was analyzed in order to understand how to apply principles and theories to the project.

### A. *Design for three levels of processing*

In *Emotional Design - Why we love (or hate) everyday things* Norman describes three levels of processing in the human brain and how to create design according to each one [6].

1) *Visceral*: The automatic and pre-conscious level where first impressions and appearance matters the most. Visceral design handles initial impact of a product, appearance, touch and feel.

2) *Behavioral*: The behavioral level in human beings is valuable for well-learned, routine operations and is like the visceral level not conscious. That is why a person can drive a car while simultaneously thinking about something else. It is all about use and experience with a product where function, performance and usability play a big role for pleasure and effectiveness of use.

3) *Reflective*: The highest evolutionary level of development is where the human brain can think about its own operations. This is where reflection, conscious thought, learning new concepts and generalizations about the world resides. The overall impact of a product comes from reflection, through retrospective memory and reassessment. Customer relationships play a major role at the reflective level, an otherwise negative experience with a product can be completely reversed by a good relationship - turning customers into loyal fans.

Any real experience involves all three levels but even though all levels have been considered no single product can hope to satisfy everyone, the designer must consider the audience for whom the product is intended. A roller coaster is a great example of when two levels play off each other - the initial visceral fear and angst competes with the reflective pleasure that derives from the ride. Now imagine how a reflectively good experience with an app could overcome any negative experience a user might have from a visceral or behavioral point of view.

### B. *The importance of playfulness*

There has been a rise of hybrid products that blur the distinction between everyday reality and playful space, the importance of *playfulness* in domains other than game design has increased markedly [7, p. 8]. This might be due to modern applications competing for users attention, thus more dimensions are added to the user experience. Playfulness is an attitude of the mind, a mood, that prepares for play [8]. Playfulness as a concept could be explained as a human trait, incorporating it in an application would thus make it seem more human. While the importance of playfulness in leisure applications has been thoroughly recognized [7, p. 8], this thesis focused on incorporating the playfulness in an application addressing domestic chores such as submitting your clothes for dry cleaning. Playfulness has also been explained as an overlooked, under-appreciated and rarely measured component of user experience - one that could make the user experience more engaging, interesting or compelling than another [7, p. 8]. This way a person could be intrigued to use a product or service over its competitor.

### C. Avatars and their relationship with humans

The term *avatar* is originally referred to a graphical representation of a humanoid controlled by a user according to Rich and Sidner [9]. Just like the authors themselves, this thesis defines avatars as intelligent graphical agents in general - not presumably controlled by a user. Rich and Sidner acknowledges the importance of emotions in human behavior and how avatars could interact emotionally with humans. Thus simulating emotional reactions in an avatar could affect how the user perceives the application of which the avatar is implemented. The authors also describes how avatars need to recognize the emotional state of its human partner. Therefore, the avatar should express itself in different ways depending on the emotional state of the user.

### D. Brand voice, UX and Microcopy

InVision is the world's leading design collaboration platform with over 900,000 designers using their platform [10]. They promote agile and iterative design processes and update their blog on a daily basis with design tips and tricks to help companies acquire a user-centered design mindset. One of these posts written by Laura Busche is a user guide for incorporating a brand voice in an application, making users feel connected, amused and delighted while using it [11]. Busche thoroughly describes three steps in order to make a product speak *human* - not robot.

1) *Find a brand personality*: This is where the company must ask themselves what makes the brand humane and why that would matter. It is about finding what traits traditionally described as human traits that are linked to the brand - in other words, what characterizes this specific brand? Busche finishes the step in a quote: "*People relate to people, and if your brand feels like 'people,' they'll relate to you too*". Thus, finding what makes the brand relatable is key in finding the brand personality.






2) *Define a brand voice*: This step defines what to say, where to say it and above all how to say it in the application. This is where the company must specify their likes and dislikes, take a stand on certain questions and define how the brand should express itself. Busche produced a template for defining a brand voice. It is used as a tool for deciding what language to use in different situations. The template was used in chapter VIII and can be found in figure 2

3) *Translate it into user experience*: Busche gives a few examples of where to incorporate the new brand vocabulary including sign-up flow, notifications and help section to name a few. She also acknowledges the struggles of not crossing a line, if the brand personality becomes too casual or if it scares users away. Following the language defined in the template will help in these situations. Finally, she showcases some examples in the use of *microcopy*, words or small pieces of text that might not have a very important appearance but will mean everything to the user as shown in figure 3.

### E. Agile software development

Software development projects need to adjust to constantly changing requirements within turbulent environments [12]. Agile software development aims to find balance between reliable structures and sufficient flexibility to accommodate change. There are several agile methodologies like Scrum, Lean Software Development, Test-Driven Development, Agile Unified Process and Extreme Programming where most agile principles are derived from proven industry concepts like Lean Production. Agile methodologies aim to reduce the complexity of planning and delivering high quality products by focusing on customer value. Scrum is a commonly used methodology based on iterative development. In Scrum three roles are defined as product owner, team and scrum master. The product owner represents stakeholders such as customer and marketing and has to ensure to be representing the interests of all stakeholders by providing requirements to

## BRAND VOICE TEMPLATE

VOICE TO EXPRESS:	WORD BANK	SAMPLE PHRASES
Excitement 		
Encouragement 		
Concern 		
Regret 		
Gratitude 		

www.leanbranding.com

Figure 2. Brand voice template

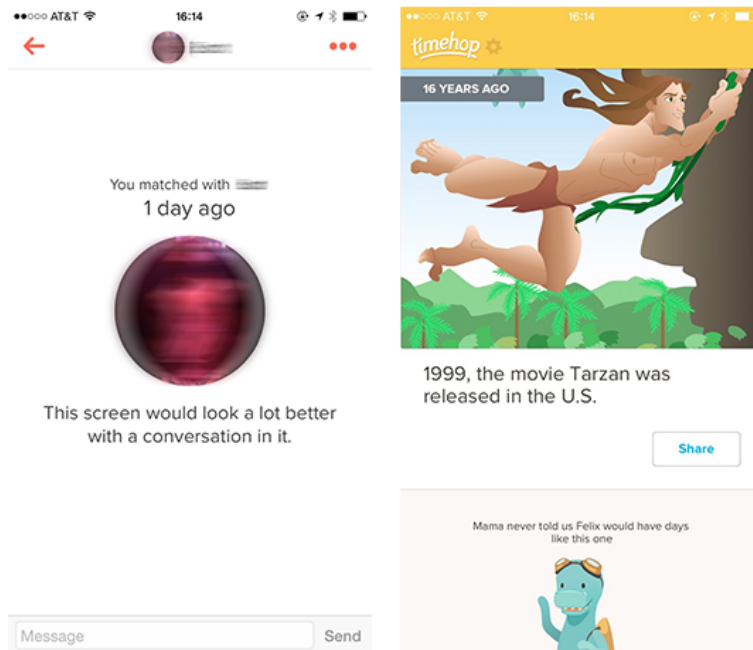


Figure 3. Examples of microcopy text in the apps Tinder and Timehop.

the project. The team is of course the development team responsible for developing and testing the product. The scrum master is responsible for the project to follow the Scrum process and adjusting the Scrum methodology to this specific project and organization.



## VI. TECHNICAL DEPENDENCIES

This thesis work handles more than research and design. Implementing a complex system demands some external technical dependencies which are described in this section.

### A. Choice of platform

The Startup already had a somewhat developed mobile customer application for Android. One of the prerequisites for this thesis work was not only improving design of that application, but also developing it for iOS where no work had been made before.

### B. iOS Development

Developing for iOS is only possible on an Apple made computer such as the MacBook. The development environment is called XCode and is only available on the Mac App Store [13]. The programming language Swift was introduced in 2014 replacing Objective-C as the recommended language for developing iOS applications [14]

1) *XCode*: This environment includes interface design, coding, testing, and debugging in an integrated application for an easy workflow. The XCode icon can be seen in figure 4.

2) *Swift*: The programming language Swift is built on research on programming languages and years of experience in developing iOS applications. It is a modern language with easy to read syntax, the Swift icon can be seen in figure 4.



Figure 4. XCode and Swift are used for developing iOS apps.

### C. Git

The distributed version control system Git is designed for small to large projects and helps keep track of changes and merges of code [15]. For this project GitHub was used as a server for uploading code, making it available to The Startup for future development. GitHub is used by over eight million people and is designed for collaborative development and easy code sharing [16].

## VII. WORK PROCESS

For designing and implementing an application it is an advantage to use some sort of agile software development methodology and software project management tool to keep track of scope, time and effort.

### A. Personal Scrum

The agile software development methodology Scrum that was described in chapter V is a framework for team collaboration on complex software projects [17]. This thesis work was conducted by only one person, thus the original Scrum method needed to be altered in order to better suit the circumstances. There are some people with experience in "one-person-Scrum" with blogs describing their way of applying the traditional Scrum onto their one-person projects, the term "personal Scrum" has been coined for this type of project. John Pruitt is a certified Scrum Product Owner which means that he is in charge of the product backlog in Scrum projects [17]. The backlog is a list of everything needed in a product and as the Product Owner, Pruitt ensures the transparency and order of the items in the list. While conducting his graduate project he used personal Scrum to produce his open-source product [18]. While thoroughly describing his interpretation of personal Scrum he also posted his entire project chronically in nine sprints [19]. Each sprint is an iteration consisting sprint planning, feature list update, implementation and finally demo and retrospective. This thesis project followed Pruitt's principles of personal Scrum in order to maintain focus and project overview.

### B. Overall activities for sprints

This thesis work is broken down into six sprints according to figure 5, following overall activities are to be covered by the sprints.

- 1) Identification and analysis of target group
- 2) Analysis of personality in other apps
- 3) Analysis of current Android solution and concept design
- 4) Low-fidelity prototype
- 5) Implementation of high-fidelity prototype
- 6) Usability tests comparing with and without personality
- 7) Implementation of possible improvements

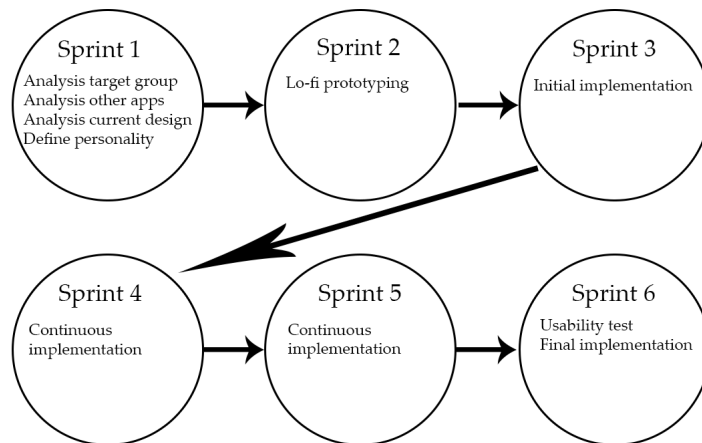


Figure 5. All sprints for this thesis covering development from initiation to a finished prototype.

### *C. Burndown charts*

For each sprint, a burndown chart was produced with estimates on how much time each sprint should take. This is a Scrum method for keeping track on remaining effort for the given time in each sprint. Each sprint consisted of activities bundled together in stories traditionally measured in story points. For personal Scrum burndown charts should be done in terms of estimated hours of work rather than story points, on a one-week sprint a single person is unlikely to finish more than a couple of stories. Thus, each sprint was estimated in working hours based on all activities to be able to produce burndown charts.

## VIII. SPRINT 1 - RESEARCH

The very first sprint handles research regarding target audience and analysis and comparison of other mobile applications. There is also an analysis of current solution for Android and finally a definition of the branding voice.

### A. Planning

For the first sprint an initial backlog was created in Microsoft Excel as in figure 6. This backlog contains key activities for the project and will continually be updated once more stories are being produced. Specific tasks have been elicited from the backlog for the first sprint and

Id	Story	Value	Priority	Story Points	Release #	Sprint #	Done?
1	Identify brand personality and voice	If the product speaks human, it will become relatable to the users - making the application more attractive	1	4	1	1	No
2	Identify and analyze target group.	With better understanding of target group the easier it will be to design an application for that specific group.	2	1	1	1	No
3	Analysis of personality in other apps.	Understanding how other apps target their specific audience will ease the process of finding the right way to target this group.	2	4	1	1	No
4	Analysis of current Android solution.	Analysing current design will ease the process of finding improvements and where to insert personality.	1	4	1	1	No
5	Create a low-fidelity prototype	By creating a prototype on a piece of paper, testing ideas and solutions will be easier. Less effort spent on changing features in the final stages.	2	8	1	2	No
6	Create a hi-fi prototype -Release 1	Create a testable hi-fi prototype in preparation of the usability test	1	32	1	3,4,5	No
7	Usability test	Analyze if the personality in the application is improving the user experience	1	8	2	6	No
8	Improve hi-fi prototype - Release 2	By using data from the usability test there can be improvements and continuous development of the application	2	16	2	7	No

Figure 6. The first draft of the product backlog

the results of these and a burndown chart can be viewed in part F in this chapter where analysis of current sprint is done.

### B. Analysis of customers

Some employees at the San Francisco tech company have worked for a dry cleaner in order to get a grip on certain processes in the business. They are American, brought up in a society where there are dry cleaners at every other corner. Four interviews were made on these employees during this sprint in order to receive qualitative data on customer traits. The following section is a customer analysis based on these interviews.

At the core of the dry cleaning business are the men's shirts, for men in need of their shirts cleaned and ironed for their business meetings. Not only the high-end expensive ones but all kinds of shirts in need of cleaning. Although professional men are the driving force behind the large amount of dry cleaners in the U.S. the target audience is quite more diverse than that. You could continue describing different clothing that are submitted for dry cleaning but it will be more useful to understand the people behind the clothing. Four kinds of people using dry cleaning services have been described here.

- 1) The people that find the use of dry cleaning practical, for example families that could use the services in order to save time.
- 2) The people that have to use the services, people of certain professions that include uniforms like police officers, chefs or waiters.

- 3) The people that are seeking convenience and are able to pay for it. This is probably the largest group.
- 4) The people that have invested a lot of time and effort in their wardrobe, their clothes are a treasure to be gently taken care of.

A lot of clothes are being submitted to the dry cleaners every day. What is to be remembered is that laundry includes services on peoples personal belongings. Therefore should it be a personal experience according to the employees at the tech company. The customer application will often be used on a weekly or even daily basis and should be a delightful experience to give the customer the impression that their clothes are being cared for.

### *C. Personality in other apps*

To be able to incorporate personality in an application it is important to analyze how other apps have succeeded in doing so. Here is an analysis of two applications and also an analysis of competitor applications.

1) *Timehop*: An app that incorporates playfulness through microcopy text and an avatar is Timehop that lets the user experience old photos and updates made on social media over the years [20]. Timehop was ranked in the top 200 apps in the U.S. in 2014 [21]. As seen in figure 7 at number 1,2 and 3, they have used amusing microcopy text in order to turn the interaction into a personal experience. The application has incorporated a witty persona while still being able to supply the user with useful information. At number 1 and 4 the dinosaur avatar of the application is in use. This playful character pops up where the user can least expect it, when refreshing a page or when reading the credits. This way a dull or uninteresting interaction suddenly becomes delightful, making the user want to try the same interaction again and again.

2) *MailChimp*: A service that enables companies to send automated emails to their subscribers is MailChimp [22]. The MailChimp team have incorporated a subtle personality throughout their applications, something they have done consciously [23]. They know that their audience are professionals and they talk to them in an efficient and bright way. As described in their style guide they would never write this: *"Facebook is a great social-media website where you can create a profile and connect with friends. Facebook and MailChimp can share information, so you can add a MailChimp signup form to your own Facebook page."* but instead describe the same thing more efficiently: *"Add a newsletter signup form to your Facebook profile. Here's how it works."*

As seen in figure 8, MailChimp incorporates their personality onto different platforms. At number 1 they celebrate their new feature through a colorful banner in the mobile application, while at number 2 providing useful information efficiently and subtle. Number 3 and 4 are examples of conversational tone in the web application, keeping the reader at ease although something negative has occurred. Although Mailchimp does not use avatars per se, their logo is a funny looking chimp that is found throughout their applications - adding another dimension of personality.

3) *Competitors*: Searching the App store for laundry services results in a few apps customers can use to order their dry cleaning services just like the one being developed during this thesis. The apps are all limited to specific geographic areas where the dry cleaner connected to the app can offer home deliveries. When this sprint was conducted, three applications were the top downloaded ones in the App Store and can be seen in figure 9. For this sprint the apps are downloaded and tested in order to collect subjective data on how the personality in the apps take form - what animations, looks and language are used. Objective data is collected by going

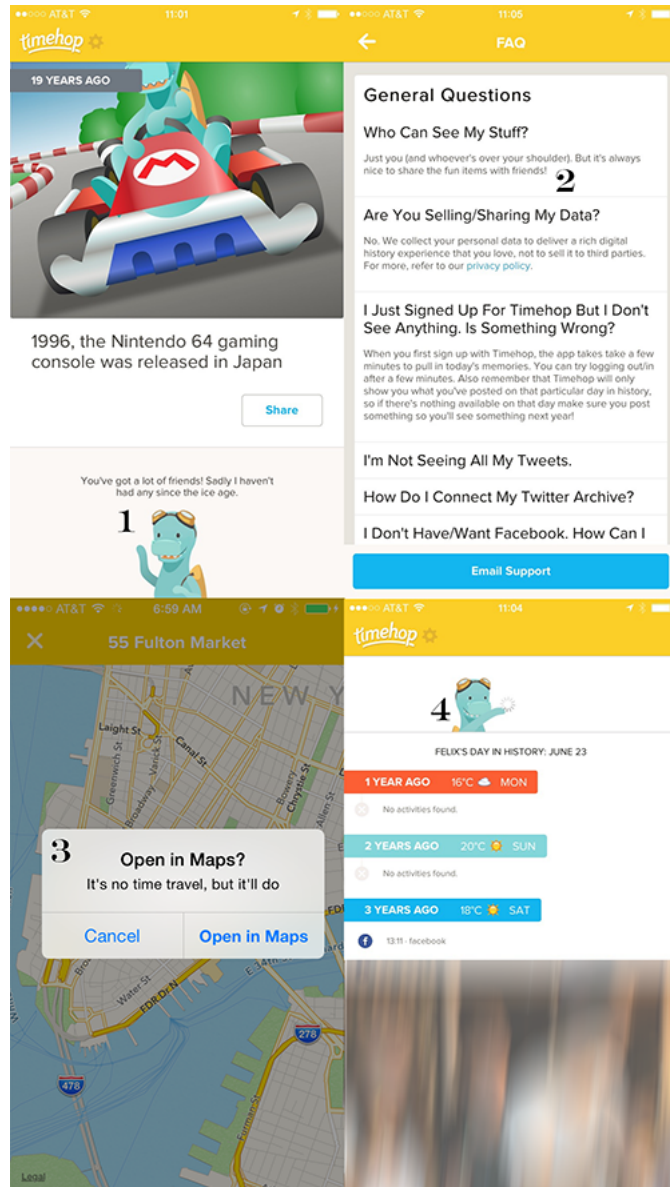
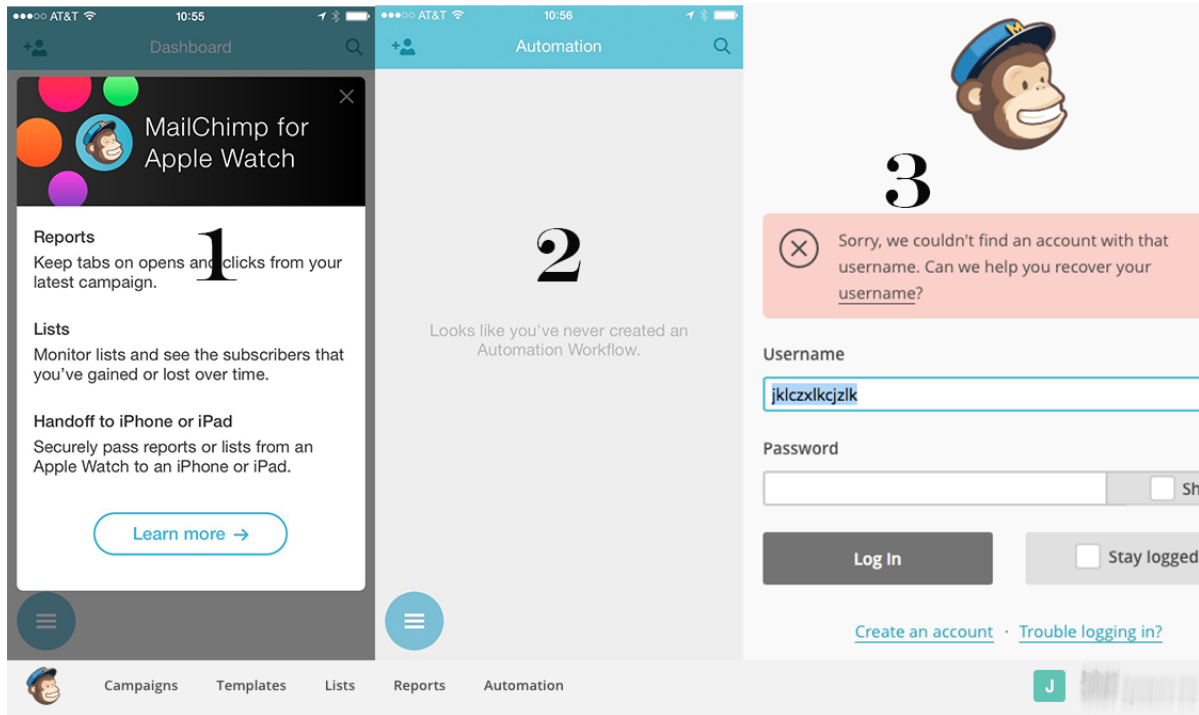


Figure 7. Microcopy and avatar use in Timehop

through the applications - finding what features the apps have to offer. The app Laundrapp is the most popular laundry and dry cleaning app in the UK according to themselves [24]. The app is using a formal language and is directed towards dry cleaning of fancy clothing. It has incorporated neat animations and a clean interface. Another app is the Fabricare one belonging to a dry cleaning business in Fairfield, Connecticut [25]. Their app has a very simple and direct interface although not many features. The app is basically a single form specifying the customer's address and washing instructions. The last app Rinse is owned by a San Francisco based company [26], their application is even more simple than the previous one. A clean interface lets the user order their dry cleaning home delivery. The Fabricare and Rinse apps are quite primitive apps without special features other than placing an order. The Laundrapp on the other hand display nice animations and visualization of prices and order history. None of these apps display current



### Chimp Chatter

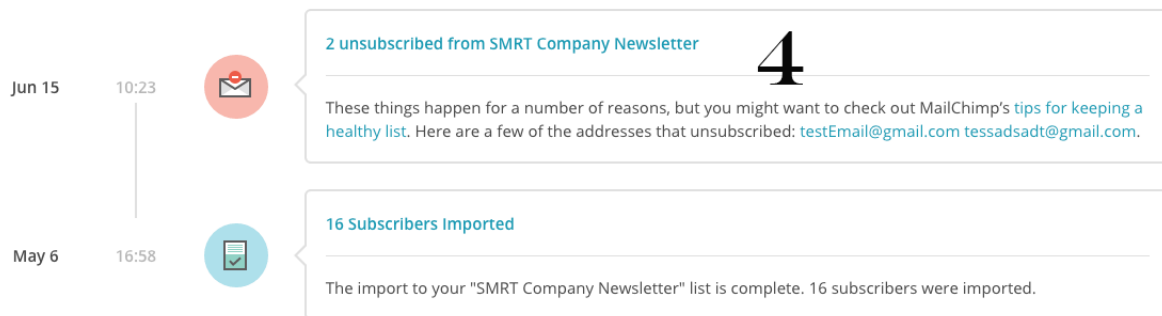


Figure 8. MailChimp incorporated personality on different platforms

order status or delivery visualization.

#### D. Analysis of current design

A mobile layout design has been made prior to this thesis and can be found in Appendix A. This layout has been partly implemented in Android but needs to be implemented in iOS with the personality integration from this thesis. The application is supposed to be page-based which means that the user can switch pages while swiping just like turning pages in a book. It will be used to order a pickup of clothes to the dry cleaner, which makes the date-picker essential. It is also an application for keeping track of the clothes submitted to the dry cleaner by checking the order status. The application is supposed to be used by a quite older crowd while at the same time be appealing to a younger one. Professionals probably have to deal with a lot of paper work and not so amusing workloads daily. An app with personality could then lighten up their day by being

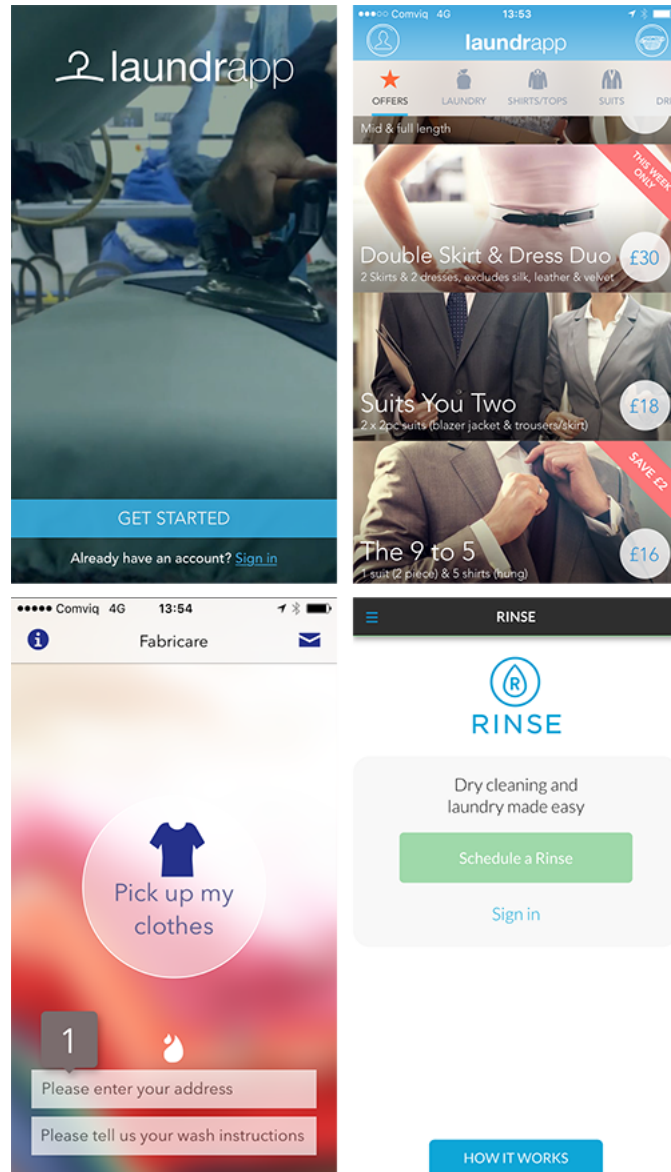


Figure 9. Laundrapp, Fabricare and Rinse offer dry cleaning home deliveries.

full of personality, witty comments and animations. The design is using a wooden background and a kind font to infuse a feeling of nature and quality. Implementing personality will have to keep or enhance this feeling while adding a delightful user experience. Microcopy text could be implemented in placeholders and some captions. There is also room for a playful avatar in order to incorporate playfulness in an otherwise mildly exciting application. The question still remains exactly how to implement microcopy text and avatar, where to incorporate personality and where it is best to leave it as it is. This will become more clear after some prototyping.

#### *E. Defining brand personality and voice*

To be able to implement personality it is important to define that personality, its voice and tone. In what way the application speaks to the user. This is where Busches brand voice template



is useful.

1) *Identify company traits:* By going through the application design and also reviewing what has been said about customers and how they interact with dry cleaners and delivery personal the following company traits have been elicited.

- *Nature* - Loathing of environmental unfriendly chemicals and forward-thinking. Hipster comes to mind and could be the looks of an avatar.
- *Relatable* - The application is of everyday use by everyday people. A voice telling users things they can relate to is optimal.
- *Trustworthy* - Handling peoples private possessions makes trust vital to a continuing relationship between dry cleaner and customer. This is probably the most important trait.

2) *Brand voice template:* Following the template in Appendix 2 the following words and phrases have been specified.

- *Excitement* - Words include *amazing, perfect, crazy, awesome* and *finally*. A sample phrase could be *"Finally, your laundry is finished!"*
- *Encouragement* - Words include *Would, please, opportunity* and *another*. A sample phrase could be *"Would you like to set another order?"*
- *Concern* - Words include *worried, not entirely sure* and *oops*. A sample phrase could be *"Oops, you forgot to set a date!"*
- *Regret* - Words include *responsibility, taking care of, everything we can* and *fix*. A sample phrase could be *"We take full responsibility for any mishaps"*
- *Gratitude* - Words include *thanks, pleased* and *happy*. A sample phrase could be *"Thanks for the order, we'll come by in just a bit!"*

3) *Where certain moods should be applied in the application:* There are certain events that could call for personal microcopy texts, some are listed below. Lots more are to be elicited when prototyping.

- *Excitement* - When an order has been placed. When laundry is done. When laundry is on its way and other status updates.
- *Encouragement* - Encouraging a user to sign up or sign in.
- *Concern* - When a user is canceling a placed order.
- *Regret* - When something has happened to the order. When delivery is delayed.
- *Gratitude* - Thanking the user for placing an order and give hopes of continuing relationship with the customer after a successful delivery.

## F. Sprint retrospective

What became obvious in this first sprint is that estimating time is hard which can be seen in the burndown chart in figure 10. There was an overestimation on how time consuming certain activities were. For future sprints it might be a good idea to do a more sophisticated time estimation. A possibility is to calculate the expected time for each activity according to PERT with expected time = (Optimistic time + 4\*Most likely time + Pessimistic time)/6 [27].

This sprint focused a lot on understanding the customer and the company. How to speak to them and how others have spoken to their specific audience. This will work as a platform for following sprints when designing the application for iOS. All sprint tasks can be seen in figure 11 and were elicited by following InVision's three steps. they were completed before deadline. This calls for an earlier start of the next sprint where a low-fidelity prototype is to be developed.

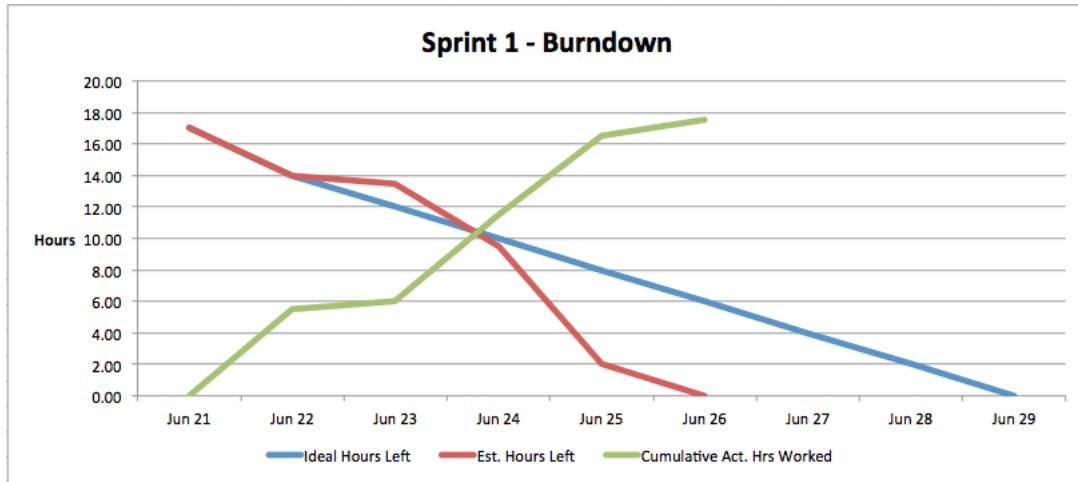


Figure 10. The first burndown chart.

Task Id	User Story Id	Task Description	Estimate h	Actual	Date Done	Note
1	2	Find traits of users - customer analysis	3	5.5	22/06/15	
2	3	Find at least two other apps - identify their users and how they integrated their personality.	4	2.75	24/06/15	
3	4	Identify all views in the current app and identify where personality could be implemented.	4	3.75	25/06/15	
4	1	Identify company traits	1	2	25/06/15	
5	1	Fill out the brand voice template	3	1	25/06/15	
6	1	Define where certain moods should be applied in the application	2	1	26/06/15	

Figure 11. The first task list

## IX. SPRINT 2 - LO-FI

This sprint was intended to cover development of avatar and lo-fi prototyping.

### A. Planning

New tasks were elicited to cover avatar and lo-fi stories in the backlog. For a more accurate effort estimation for each activity optimistic and pessimistic time were introduced.

### B. Avatar

Discussions with co-workers at The Startup were made in order to decide on what kind of avatar to use. Several animals were discussed and it was decided that it should be a local animal of San Francisco. After some drawings of different ones it was decided on a raccoon with fashion sense. Raccoon in Swedish translates to "laundry bear" which gives a double meaning. It has a playful appearance and if drawn nice enough it could add a sense of trust. What needs to be considered is to make it cool while not being arrogant. A sketch of the avatar can be seen in figure 12



Figure 12. Raccoon avatar concept.

### C. Lo-fi prototype

The lo-fi prototype was drawn in order to research how to incorporate the personality without disrupting existing functionality. The prototype was used in order to find out how to carefully add the avatar to make the application more playful. As can be seen in figure 13 the tip of the raccoon tail is visible on the home screen and if the user scrolls down, more of the avatar will be visible with some witty text. The user might not take notice of the tail tip the first time but maybe the second or third. A curious user will then try to discover what it is and by scrolling the rest of the raccoon will present itself.

Figure 14 shows a possibility of a not so subtle way of showcasing the avatar. A dull and not so interesting page in this case only showing ways of contacting the dry cleaner can be way more engaging with some avatar movement. The avatar might jump around below two alternatives of contact or wave its arms. The figure also shows what a placeholder inside a text area might display.

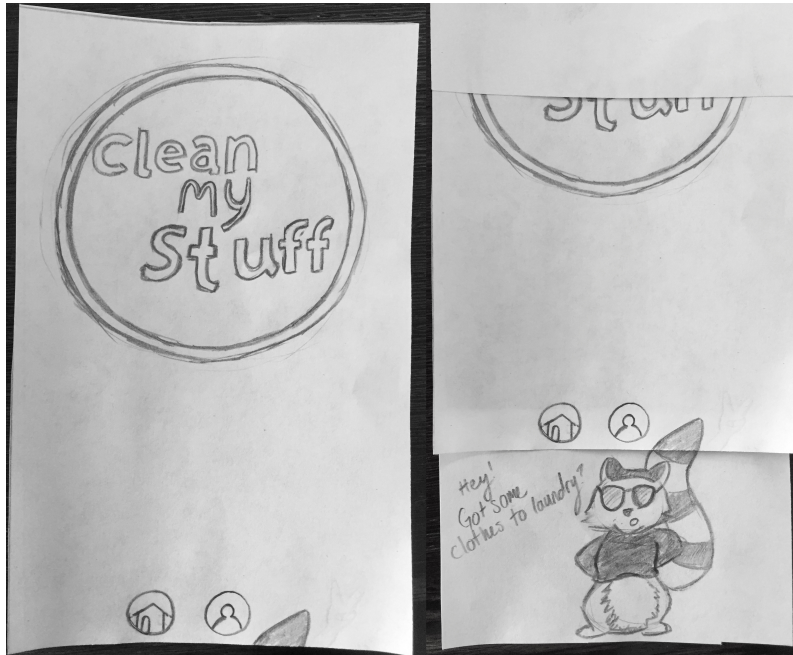


Figure 13. Lo-fi prototype with tip of the tail visible.

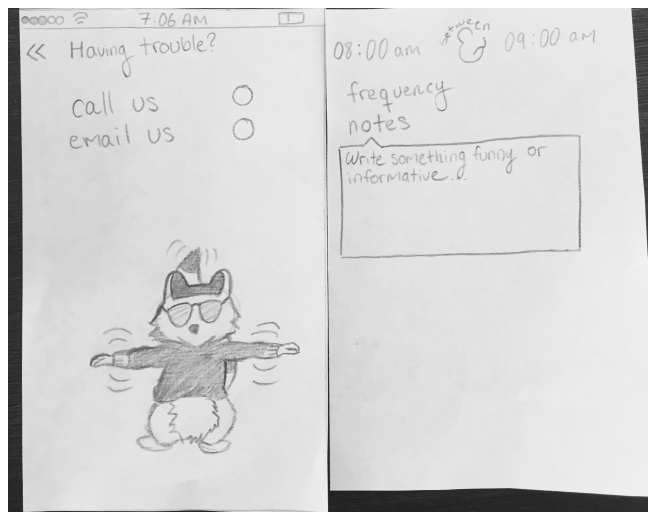


Figure 14. Lo-fi prototype of notes to an order and contact possibilities.

#### D. Sprint retrospective

Once again overestimation of tasks as seen in figure 15. The burndown chart is great for following the development of the project and chosen tasks for the current sprint. This sprint handled development of a lo-fi prototype, starting with avatar creation and then placing the avatar in a mobile context using pen and paper. It was great for trying out the concept before applying it to the real application. The project will contain development and design of avatar with animation and microcopy text, a comparison of the application with and without the personality traits will be very interesting. Future sprints will be more time-consuming since iOS development

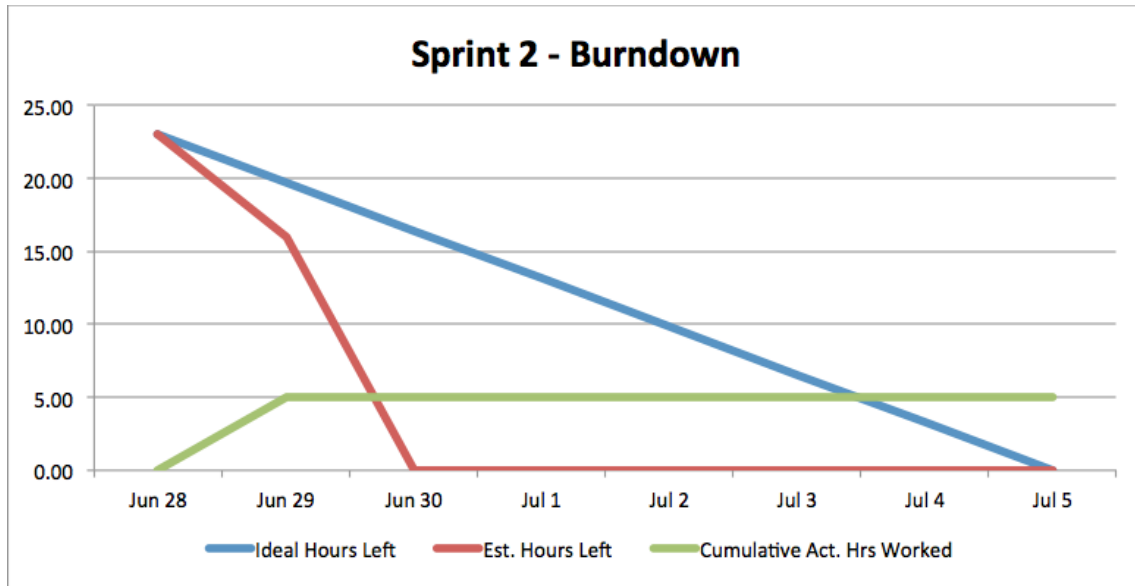


Figure 15. Burndown chart for Sprint 2

will be at hand.

## X. SPRINT 3 - INITIAL IMPLEMENTATION

This is the sprint where hi-fi development started with an initial code architecture layout and design. Also the hi-fi version of the avatar was designed and drawn digitally.

### A. Design

The avatar as seen in figure 16 was created using Adobe Illustrator and Adobe Photoshop. The raccoon has the looks of a playful hipster with color scheme that matches the application. The color scheme was chosen in order for the avatar to blend in with the application and not stand out too much. The circle as seen in figure 17 will be recurring throughout the application and eventually be seen as both informative as functional. It will be used when displaying the status of a current order and also be used as buttons. This round layout will also be used when picking a day for pickup - the app will thus use and reuse similar design in order to infuse a constant design for a cleaner interface.



Figure 16. Hi-fi design of avatar

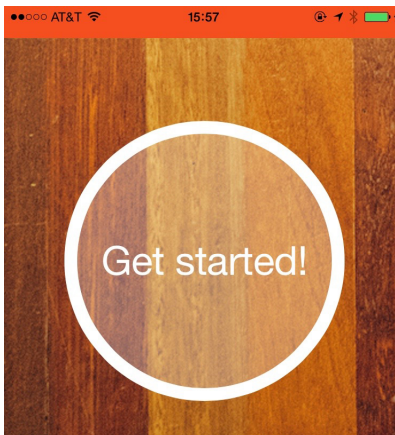


Figure 17. Circle and banner design

### B. Transition and scroll

During this sprint the code was designed for the use of page based transitions between views. It was also designed to enable scrolling. These interactions are visible in figure 18 and will be

used throughout the application. The transitions through swiping and scrolling will be combined with button presses for navigating throughout the application. For this first part of the application both a left-swipe or a press of the button "Get started" in figure 18 will transition the user to the next page. This is an interaction that will be constant in this application - giving the user the ability to choose between pressing buttons or swiping.

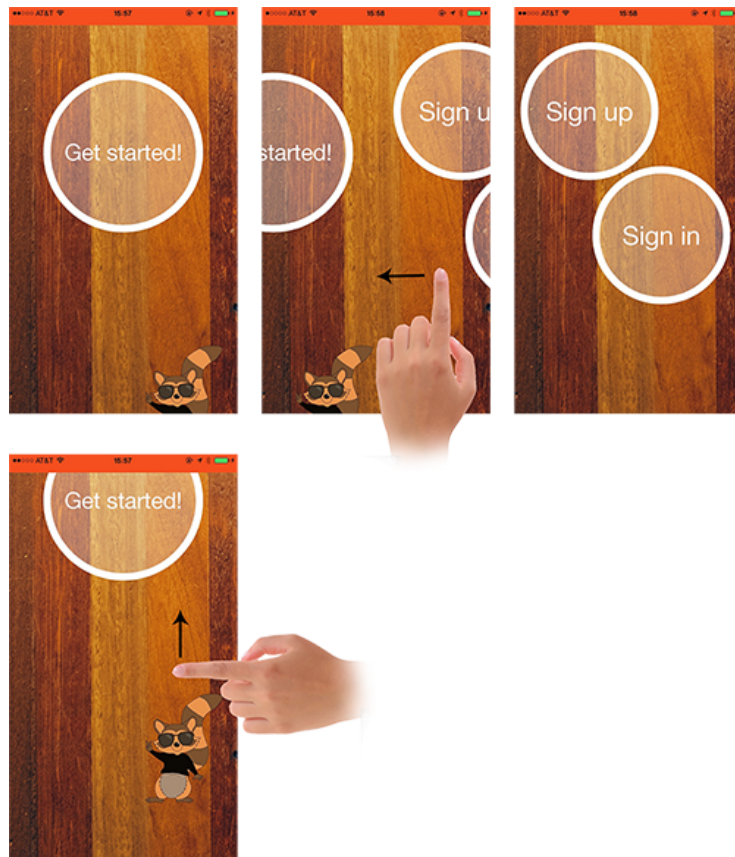


Figure 18. Transition and scroll

### C. Sprint retrospective

Following the previous sprints, this was the first underestimation of time since architecture development and implementation of transitions and scroll was more time consuming than first imagined as seen in the burndown chart in figure 19. Getting started with the development framework XCode and creating the first code hierarchy took more time than first imagined. Especially the code architecture for transitions and scrolling was initially difficult - these implementations were important for future sprints since the scrolling and swiping interactions are to be used all through the application. Activities regarding implementing dry cleaning ordering was postponed due to this delay. The sprint had to focus on initial development such as setting up the environment, architecture and interaction, what happens after the user has signed in will be developed in the next sprint.

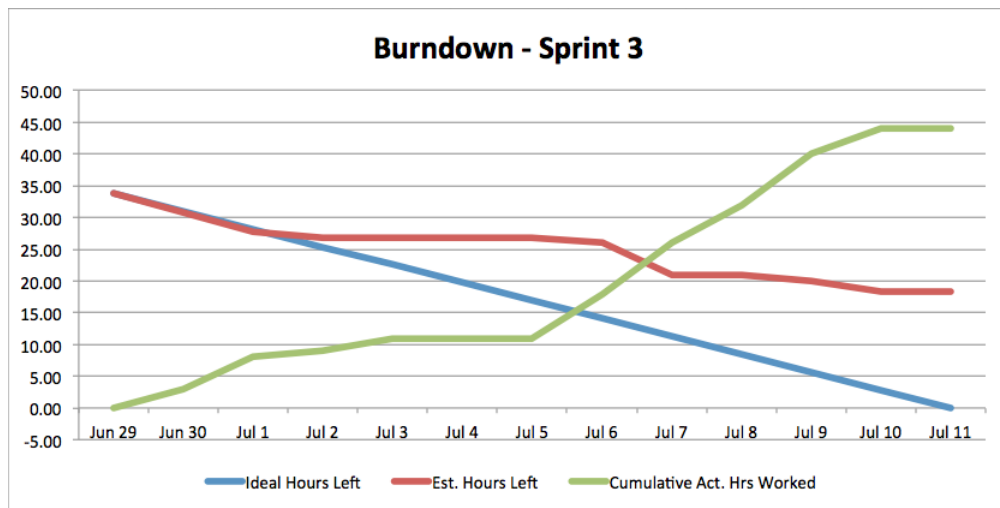


Figure 19. Burndown sprint 3



## XI. SPRINT 4 - TIME-PICKER

This sprint handles architectural obstacles and implementation of the most important part of the application - the screen for setting a time for laundry pickup.

### A. Design

When the user has logged in, a status circle will be shown displaying the words "Order dry cleaning". This is the home page and the text means that the user has yet to order the pickup of clothes. After pressing the circle the user will be transitioned to a vertical form containing different input methods used to specify when the pickup is to happen as seen in figure 20. When the user is done specifying time there will be a transition to the confirm screen that will display the information, giving the user a final chance to change what was previously input. If the user is pleased the confirm button has to be pressed in order to send the request.



Figure 20. Implementation made in sprint 4

### B. Features

Besides the implementation of design some additional features were implemented during this sprint.

- *Automatic scrolling* - When a user has pressed an input button in the vertical form, there will be a scrolling down to that area, giving the user full view of the content to be chosen.
- *Highlights after press* - When a user choose a weekday, that weekday will be highlighted with a white background instead of the half-transparent one.
- *Drop-down lists* - When specifying time and frequency, a dropdown list will appear. The user can easily scroll and choose between options inside the list.

- *Input text area* - If the user has any additional notes or requests to send to the dry cleaner, a field for free text is available. When the user press the button for notes, in addition to the automatic scroll, the keyboard will appear.

### C. *Sprint retrospective*

There were a large amount of architectural difficulties in the code during this sprint affecting the time spent. This is noticed in the cumulative curve in figure 21. Implementing the datepicker screen included customized views such as the dropdown table for picking a date. Customized views take time to implement since they are not simply added through the iOS native library, this screen also needed customized views for picking frequency and adding a note. All tasks could not be implemented in time of the sprint. The plan for this sprint was to develop several screens but the customized views should have been anticipated, thus only plan the datepicker screen implementation for this sprint. Future coding tasks should have more implementation time estimated. The design is coming together neatly and future sprints will have a bit faster development since it is assumed that the most difficult implementation was made in this sprint.

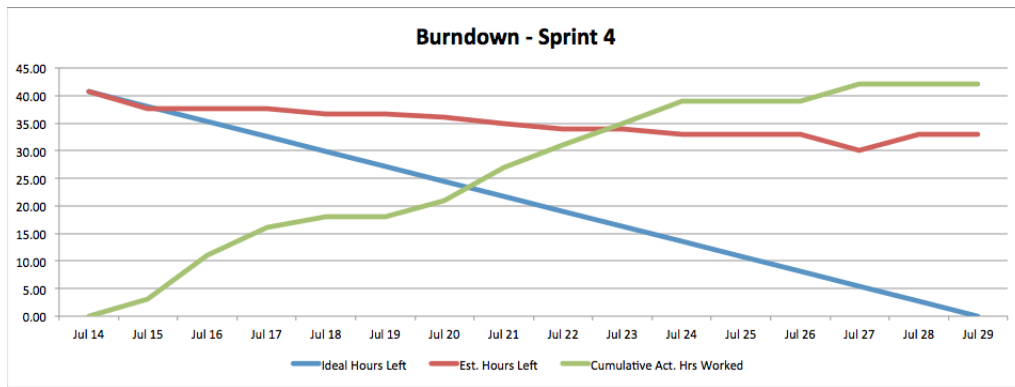


Figure 21. Burndown chart sprint 4

## XII. SPRINT 5 - MORE DESIGN, FEATURES AND SETTINGS

During this sprint there were some improvements on the timepicker screen. The home screen was more thoroughly defined with all statuses implemented. The settings part of the app was also finally implemented. Navigation between the status screen and the settings part of the application was defined with two important menu buttons implemented.

### A. Design

Some design choices were made during this sprint.

- *Home and settings icons* - The home and settings icon was implemented and placed at the top as can be seen in figure 22. This placement was chosen in order to make room for any personality traits to be implemented at the bottom. The icons were designed prior to this thesis and can be seen in figure A. The icons will be marked with a transparent white background when user is at that part of the application. The original placement of these icons were at the bottom of the screen but this placement was thus rejected.
- *Status pie chart* - A pie chart was designed using Adobe Illustrator and Photoshop in order to more clearly tell the user how far the order has gone and placed at the home screen in figure 22. Starting with one slice before an order has been set, ending at 6 slices when the order has been delivered after laundry. The pie chart could have been replaced by some kind of time device like a clock or hourglass but since there are six statuses a pie chart seemed appropriate. The user will notice how the chart is filled one pie at a time as the order is processed - a neat and simple way of displaying the current state of the order.
- *Error highlight* - When the user place an order without choosing a weekday an error is triggered and the weekdays light up with an orange background for a short moment as can be seen in figure 23. The color is alarming and conforms with the theme of the application as the top bar is also orange. The user will notice the change of colors and immediately take notice that no day has been selected.
- *Dots* - When text has been entered into a text field, three dots will appear telling the user that the text is entered and saved as can be seen at the notes entry in figure 23. Another implementation was to try displaying part of the text entered but longer notes would look weird on the button. Three dots seemed to convey that more text has been hidden underneath, thus this was the chosen design.
- *Cleaning progress bars* - When the user is waiting for their laundry, the progress screen will be available. This screen will show the progress in real-time with transparent progress bars according to 23. This was an idea made by the tech company and was seen in the original design in figure A. The progress bars will disappear over time as the order progresses but if this seem unnatural to the user an alternative is to reverse the process.
- *Map* - As can be seen in figure 22 a map was added for the delivery status. This map is meant to be able to show the user where the delivery van is right now and how many stops it has left on its way to the user's delivery location. This information should be accessed with a press on the map button circle. The map was created from a Google map screenshot and modified in Photoshop before implemented into the application. This is a mockup of a feature that could be implemented in the future. Due to time limits this feature will not be researched further during this thesis.
- *On-off buttons* - As can be seen at the notifications page in figure 24 a button was designed to determine whether or not a feature should be set to on or off. The buttons were created

programmatically in XCode and are straight-forward on/off switches the users are presumed to not have any difficulties understanding.

- *Several-choice and one-choice buttons* - At the preferences page in figure 24 two different kinds of buttons have been designed. The first is the several-choice button that is white when chosen or transparent when not chosen. The user can choose as many of these alternatives as needed. The second button is the one-choice button that is white when chosen and an empty circle when not chosen. The user can only pick one of these alternatives. While creating these buttons programmatically in XCode it was considered that they should be very similar due to similar function.

## B. Features

This sprint included some features.

- *Statuses* - There are six possible statuses for an order. They are visible on the home page of the application where the content of the screen changes depending on what status the order currently has according to figure 22
- *Home and settings icons* - If the user presses the home or settings icon when currently not at that position in the application there will be a transition to the respective screen and that icon will be highlighted.
- *Automatic transition* - If the user swipes to the confirm screen without picking a weekday, the user is automatically transitioned back and the error highlight is shown on the weekdays.
- *Data collected* - All of the user input at the timepicker screen is collected and sent to the confirm screen according to figure 23. This way the user can review the time before confirming the order.
- *Progress bar demo* - For this sprint a mockup animation shows the user how the cleaning is progressing over time and can be seen in figure 23. It is supposed to show how much volume of the laundry that is at cleaning, pressing, finished in need of extra care. The progress bars disappears over time and the next status is shown at the home screen.
- *Settings* - The part of the application regarding settings was implemented according to figure 24. In settings the user can change personal information, what notifications to receive and user specific preferences regarding how clothes are to be taken care of. The user can also contact the dry cleaner via the support page and view earlier orders placed at the order history page.

## C. Sprint retrospective

This sprint covered a lot of implementation and new design, since the most difficult architectural obstacles was covered in the previous sprint it was easier to implement new features on schedule. All important features have now been implemented and are ready to be tested. The burndown chart for this sprint also shows that the project was on schedule at all times even though more hours had to be added at the end when some bugs in the code had to be fixed.

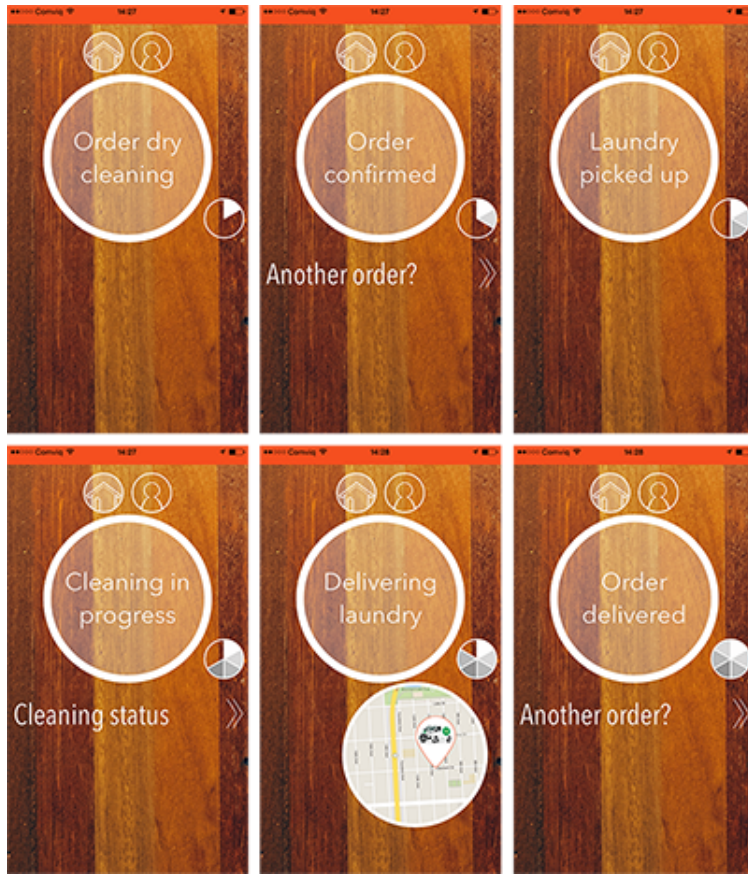


Figure 22. The home page changes depending on order status.

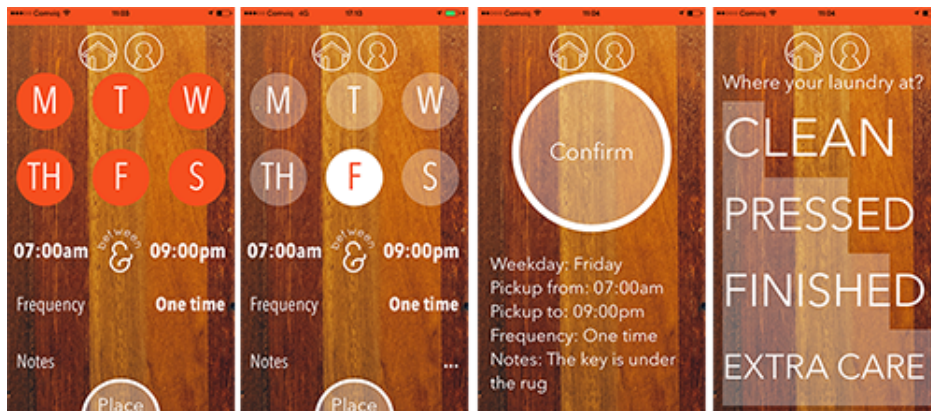


Figure 23. Some new features in sprint 5



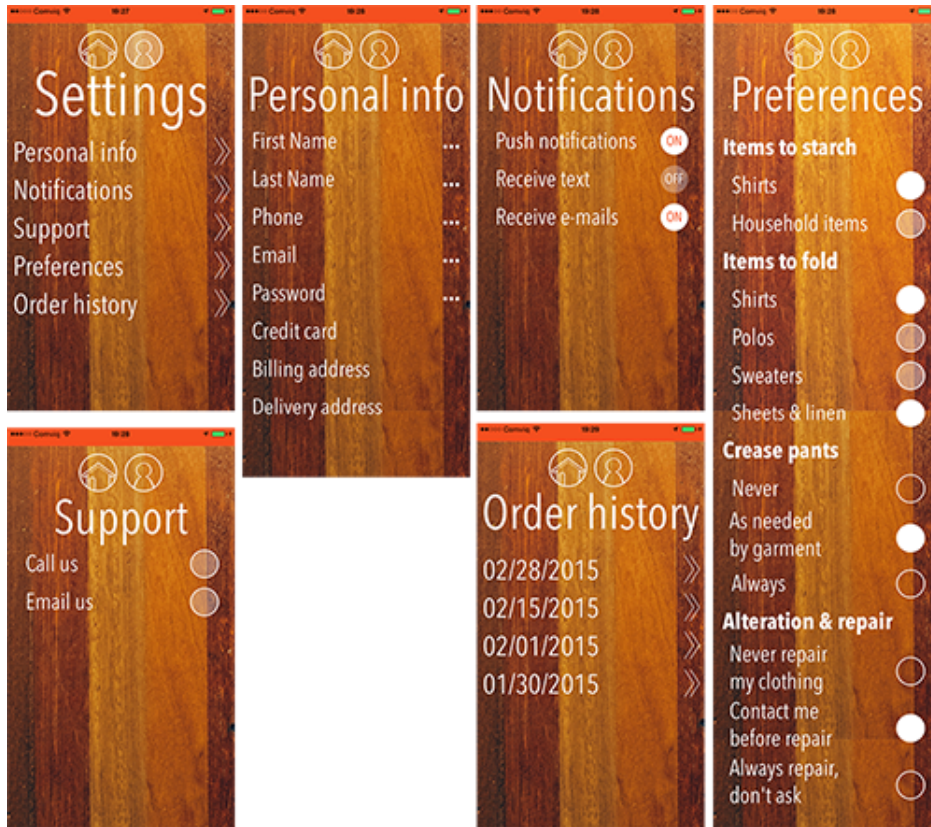


Figure 24. All views related to settings.

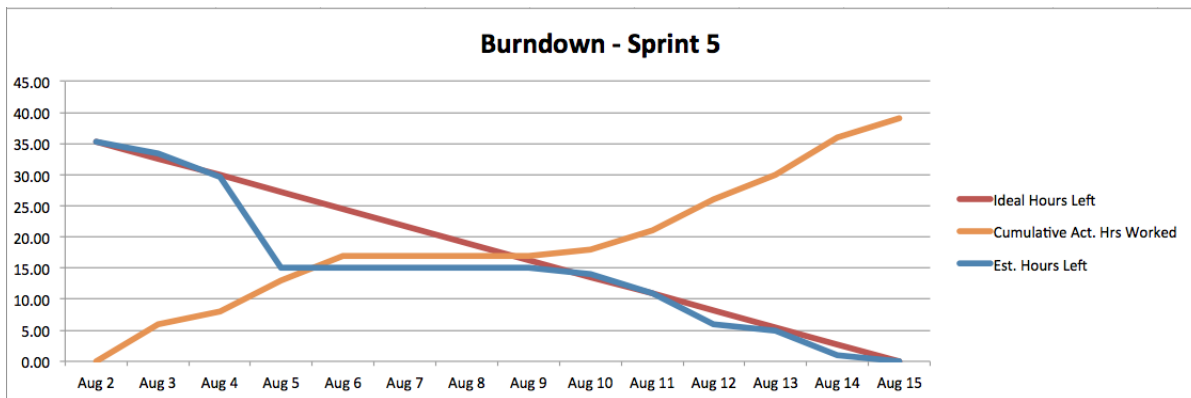


Figure 25. Burndown sprint 5.

### XIII. SPRINT 6 - PERSONALITY, USABILITY TESTS AND FINISHED PROTOTYPE

This sprint focused on finding placement of microcopy text and avatar with avatar animations for a delightful user experience. It also included definition and execution of usability tests comparing the app before and after the addition of personality. An app icon was also designed during this stage.

#### A. Avatar

There was quite a bit of room below the big status circle at the home page (see figure 22). An idea here inspired by the app Timehop in figure 7 was to let the tail of the avatar be just visible on the original placement of the screen before the user has scrolled. This would be a clue to the user to scroll down just a little bit, uncovering the rest of the avatar as can be seen in figure 26. When the status is at "Delivering laundry" there will not be an avatar at the bottom of the page since the map is taking up too much space. Instead the head of the avatar was placed at the dropped pin together with the van, implying that the raccoon is delivering the customer's laundry, a funny addition to this page. The head of the avatar was also placed at the notifications and support page in the settings part of the application. Those were the only places suitable for avatar placement since the other pages showcase too much information. If the avatar was used at those pages there would be too much attention taken away from important information.

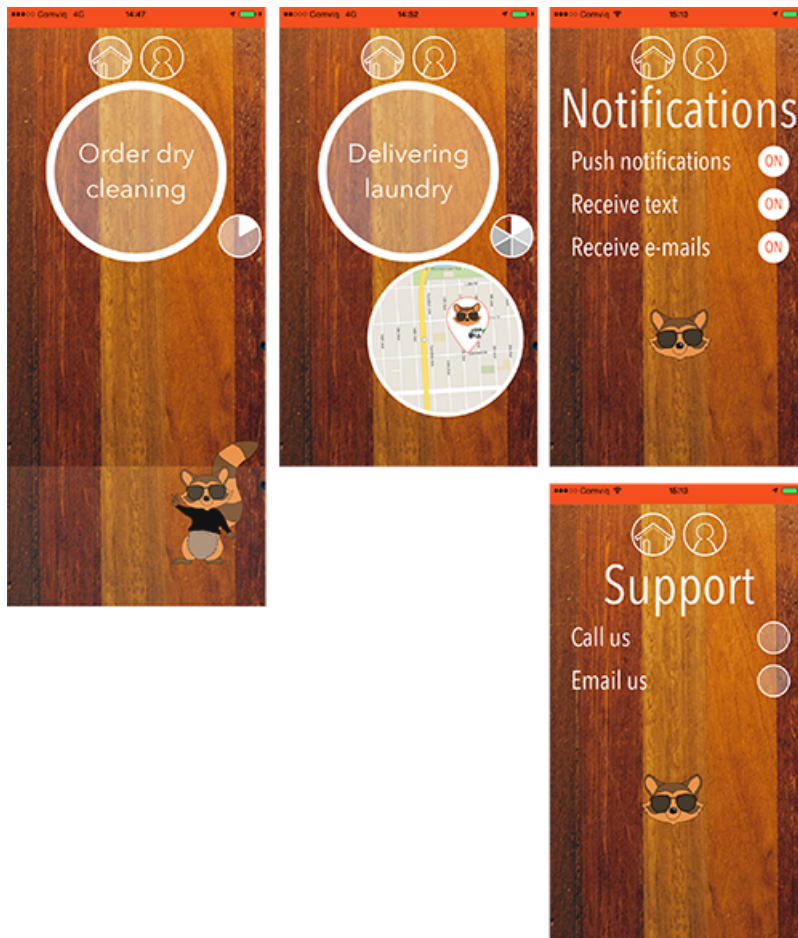


Figure 26. Placement of avatar throughout the application.

## B. Microcopy

The home page of the application contains a big circle displaying the status of current order according to figure 22. This calls for an opportunity where microcopy text could be used and changed depending on what status is set to the current order. The solution developed during this sprint was to define for all but one status a collection of phrases to be used for that specific status. These phrases would then be used and placed together with the avatar at the home page according to figure 27.

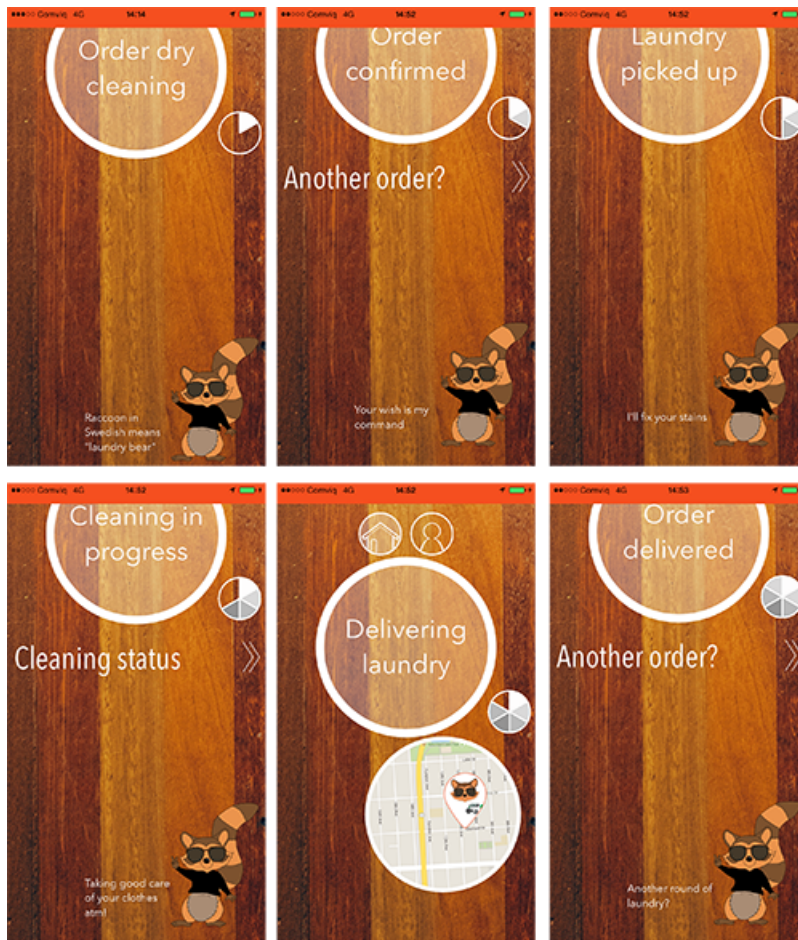


Figure 27. Use of microcopy at the home page for all statuses except the delivery one.

Microcopy was also introduced as placeholders during this sprint. When the user is applying a note to their order and when changing their personal information in settings, instead of an empty field the user is greeted by personal messages. This implies a conversation between user and application. Some placeholders can be seen in figure 28. The confirm screen in the same figure was improved with a caption telling the user that the information below was collected from the values the user set for the order at the previous page. This is said in a conversational tone, trying to make the quite uninteresting page more intriguing.

## C. Animations

To make the avatar seem more alive, animations were necessary. Advanced animations for natural movement in an avatar take a lot of time and effort, but during this sprint it is assumed



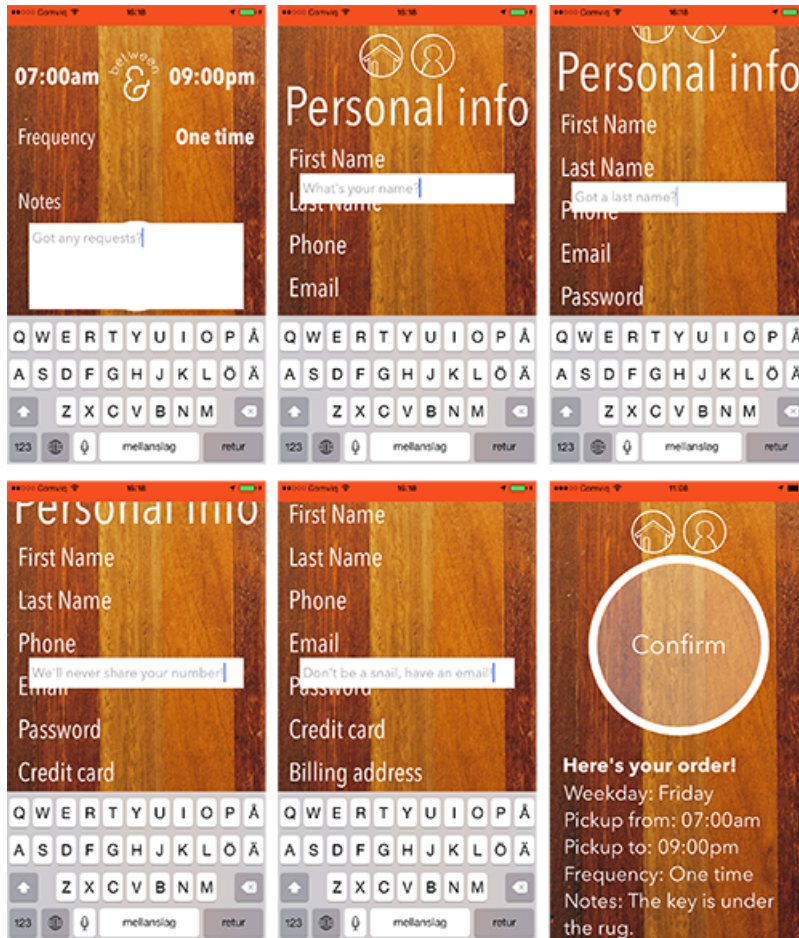


Figure 28. Use of microcopy as placeholders.

that simple ones can also make a big difference. The avatar and their conversational microcopy text are animated at the home page in figure 27. They can move forth and back across the screen. The glasses on the avatar seem to be detached through a small rotational animations going forth and back at the nose of the avatar. Moving objects can take too much attention from the useful information in the application and seem like an annoying feature. That is why there was an implementation made at the home page giving the user control over the animation. When the user first logs in to the application the pie chart is animated through a slowly blinking background as can be seen in figure 27. This tells the user to try pressing the pie chart, making the avatar start the animation and the tail is seen moving across the screen. Another press and the animation stops. The same animation can be started by a simple press on the avatar itself. At notifications and support in settings the head of the avatar is also animated with the same rotational animation of the glasses. The head moves vertically forth and back in notifications and horizontally in support. There is no button control over this animation since it seemed unnecessary - it will not be an annoying feature when there is such a short amount of time those pages will be visible in comparison to the home page.

#### *D. Usability test goals*

When performing a usability test it is important to have elicited the reasons behind performing the test. That way the right method of testing can be used. The following objectives have been elicited for this usability test:

- Is usage of the application a positive experience?
- Will implemented personality result in a reflectively more positive user experience compared to the same application without implemented personality?
- Will the user understand the whole cycle of placing an order - from placement to received delivery?
- Will the user understand how to transition from one screen to another, through swiping gesture or button press?
- Is the avatar placement and choice of animation sufficient? Should the user still control the animation at the home page or should it always animate without the press of a button?
- Do icons and images in the app convey their usage?

#### *E. Usability test*

For the usability test a test plan was developed in order for the conditions to be equal for all test participants [28, Chapter 5]. The test covers the usability test goals and contain four parts:

- *Context and background* - A short oral presentation, setting the context and telling the test participant of the application background.
- *Test scenarios* - Written scenarios or missions for the participant to complete, using two versions of the applications. One without personality and one with personality implemented. The scenarios can be found in table I.
- *Post-test questionnaire* - For quantitative data there will be a questionnaire after each round of user scenarios containing questions regarding user experience, navigation, language of the application and use of avatar. The questionnaire can be found in table II.
- *Debriefing* - There was one debriefing conducted during the test, after completed rounds of user scenarios and questionnaire. This conversation with the user collected important qualitative data about the reflective thoughts on the application.

Half of the test participants got to test the version of the app without personality first, the other half got to test the version with personality first. This would rule out any favoring of application due to which one was tested first. The tests were audio recorded in order to be able to analyze the reactions of the participants afterwards.

#### *F. Usability test results*

For the usability test, ten people were recruited. They ranged in ages from 22 to 26 years old. Eight of them were students at Lund faculty of engineering, the other two were not students. Nine participants managed to complete all test scenarios below 5 minutes. Only one participant had trouble finishing scenario number 2 but managed to do so after a little while longer than the rest of the participants. Since such a large amount of the participants managed to complete the scenarios in a short amount of time it can be assumed that the app is easy to use. There did not seem to be any apparent favoring of application depending on which version was tested first.

As can be seen in figure 29 and 30, more people tended to prefer the app without personality implemented. Not by much, but it was still preferred. This was confirmed from listening to the debriefing sessions, some participants loved the avatar but most of them thought of it as "not serious" or "disturbing". Everyone were fond of the language in the application, especially in the

Table I  
TEST SCENARIOS.

Scenario #	Scenario text
Background	You are an american currently living in San Francisco. You have an office job requiring you to wear nice clothes that need special care when washed. You have already signed up for this mobile application where you can order dry cleaning to your house, the dry cleaner already have your personal information, payment credentials and delivery address.
Scenario 1	It is Sunday evening, you just realised you only have clean clothes until wednesday and you have an important meeting on thursday. With a bag full of dirty clothes for the office and no time to go to the dry cleaner yourself you want someone to come pick up your clothes. You put the key under the rug by the door and want to let the dry cleaner know that they can use it to collect your laundry bag that is indoors by the door.
Scenario 2	Your dry cleaner has given you updates on your laundry by both text and email. You think it is sufficient enough to use only text as a way of communication between yourself and the dry cleaner and want to make sure email is out of the question.
Scenario 3	For the next round of dry cleaning, you want to make sure the dry cleaner folds all your shirts and sweaters. You never want to find a hole in your pocket so you also want to make sure the dry cleaner repairs your clothes without asking, even if it adds an extra cost.
Scenario 4	You just changed phone number, for future communication between yourself and the dry cleaner you want to make sure they have your new number.
Scenario 5	You realise that you have some issues regarding your latest order but you don't remember exactly which date this order was placed. You also want to call the dry cleaner about your issues regarding the order at this specific date.

Table II  
TEST QUESTIONNAIRE WHERE THE FOURTH QUESTION WAS EXCLUSIVELY FOR THE APPLICATION WITH PERSONALITY IMPLEMENTED.

Question #	Question text	Measure
Question 1	Did you understand how to use the application for ordering pickup and receiving your cleaned laundry?	1-5 (1 meaning "I did not understand at all" and 5 meaning "I understood completely, it was easy!")
Question 2	Did you have any problems navigating throughout the application (swiping or press of buttons)?	1-5 (1 meaning "I could not navigate at all" and 5 meaning "I had no problems with navigation!")
Question 3	What did you think of the language used in the application?	1-5 (1 meaning "I hated it!" and 5 meaning "I loved the way the application spoke to me!")
Question 4	What is your opinion on the raccoon (the avatar animal) and its animations?	1-5 (1 meaning "I hated that avatar!" and 5 meaning "I loved it, it fit perfectly in the application!")
Question 5	What was your overall impression of the application?	1-10 (1 meaning "I hated it!" and 10 meaning "It's perfect for ordering dry cleaning!")

version with personality. The navigation part tended to be worse when the user also had to mind the avatar, causing a confusion handling transitions and scrolling. For future implementations, the following important improvements have been elicited from the usability test.

- *Change animation of progress bars* - The way the progress bars in the page showing the user how much of the laundry has been cleaned should be reversed from the way it animates

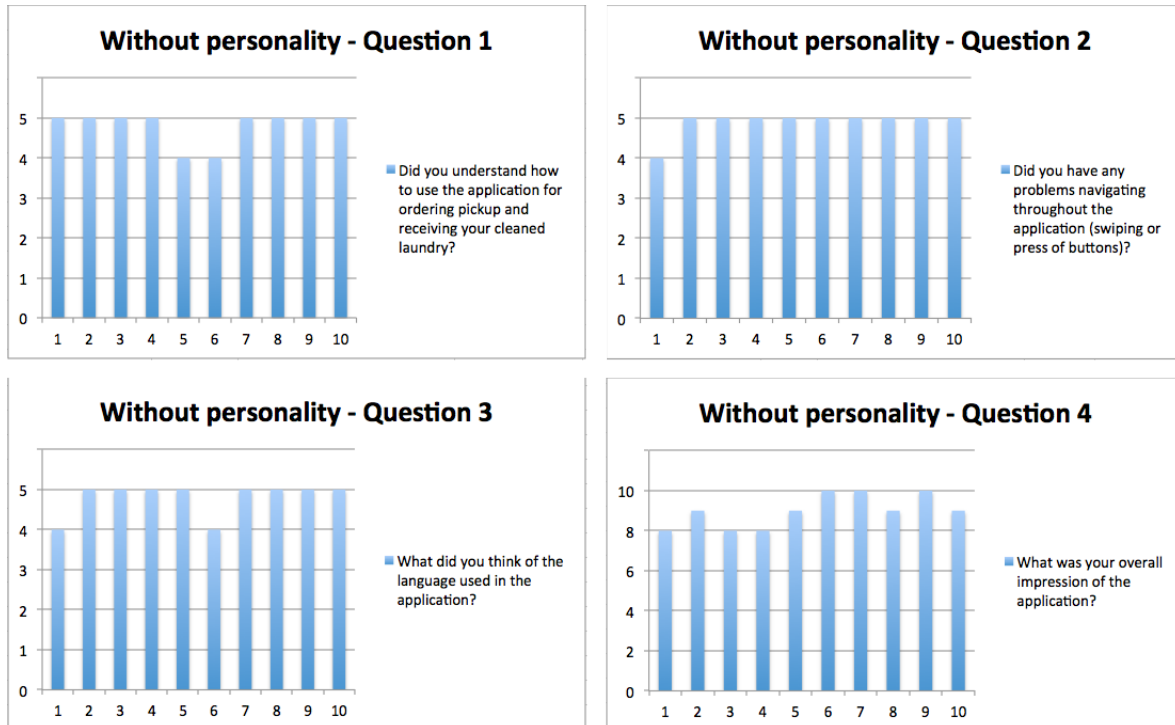


Figure 29. Usability questionnaire results for the application without personality. X-axis marks number of participants, y-axis marks the measured score for that participant and question.

now. It was confusing for the test participants to see the bars slowly removed from the screen, from debriefing it was elicited that they should instead increase in size.

- *Remove avatar* - Although some participants found the avatar quite amusing, some did not. This made their user experience quite annoyed.
- *Fix bug at the confirmation page* - Some participants pressed the information at the confirmation page. This is the information displaying day, time and notes of the order. After a press the user is able to directly change this information - a feature that should not exist.

There were also some possible but not quite as necessary suggestions for improvement elicited from the usability test, they are listed here.

- *Change of notifications* - One participant did not find the wording "notifications" sufficient for the action of changing email preferences. It was not easy for this participant to finish that test scenario.
- *Change background image* - One participant thought the background had too many wooden colors, they wanted the application to have a cleaner state. Maybe change the background into a single wooden color.
- *Move support* - One participant thought that such an important feature as support should be easier to find, thus moving it from settings to the home page.

The animation of the pie chart did not disturb the participants in any way, some even thought of it as a representation of time passing. Most participants did not even press the blinking button, probably because the figure of a pie chart does not convey any apparent function other than showing information. Some participants noticed how the avatar had a different tone in

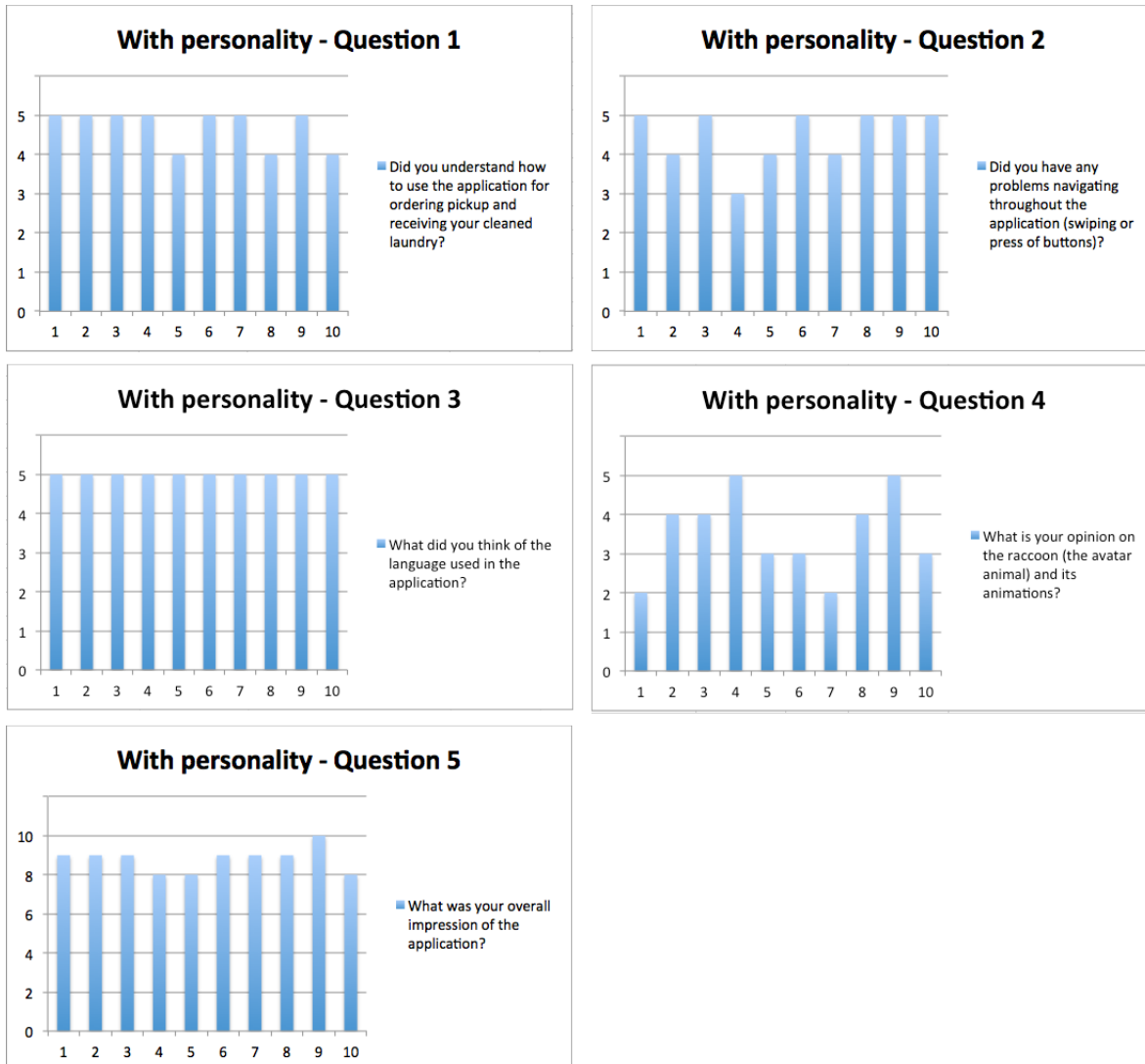


Figure 30. Usability questionnaire results for the application with personality. X-axis marks number of participants, y-axis marks the measured score for that participant and question.

the conversation depending on where the order currently was in the order process. This was appreciated because it made the avatar seem more dynamic and alive.

### G. Implemented improvements and finished prototype

For the finished prototype that can be found in Appendix 31, the most important improvements elicited from the usability test have been implemented. The avatar was completely removed from the application but microcopy text not connected to the avatar got to stay. The animation of the pie chart was set to animate at all time - symbolizing the passing of time. The animation of the progress bars in the page showing the current state of the laundry was reversed in order to better suit the action of progress.

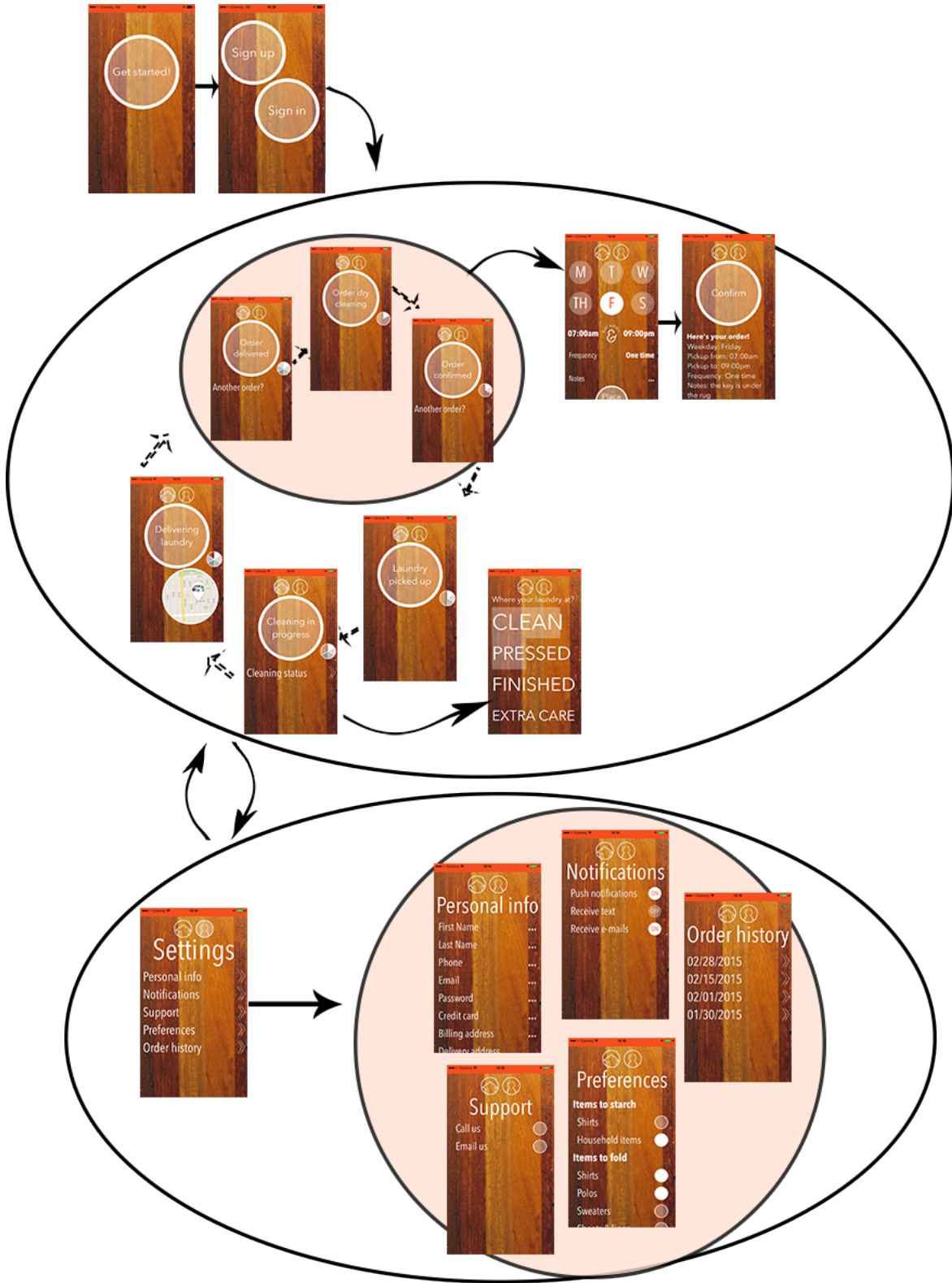


Figure 31. Complete set of pages in the application grouped by ellipses for showcasing relationship - All pages in settings in one ellipse, all pages for ordering in one ellipse etc. Pages in a colored ellipse is transitioned to and from in the same way. Filled arrow stands for a transition and striped arrow shows a change of status.

### H. Sprint retrospective

As can be seen in figure 32, this sprint was finished on time. It was very important to follow the schedule in this sprint because of a small time period where the usability test could be performed. This was the last sprint for this thesis, a sprint where earlier assumptions about the use of avatars was proved wrong, resulting in an application without avatar but including microcopy text.

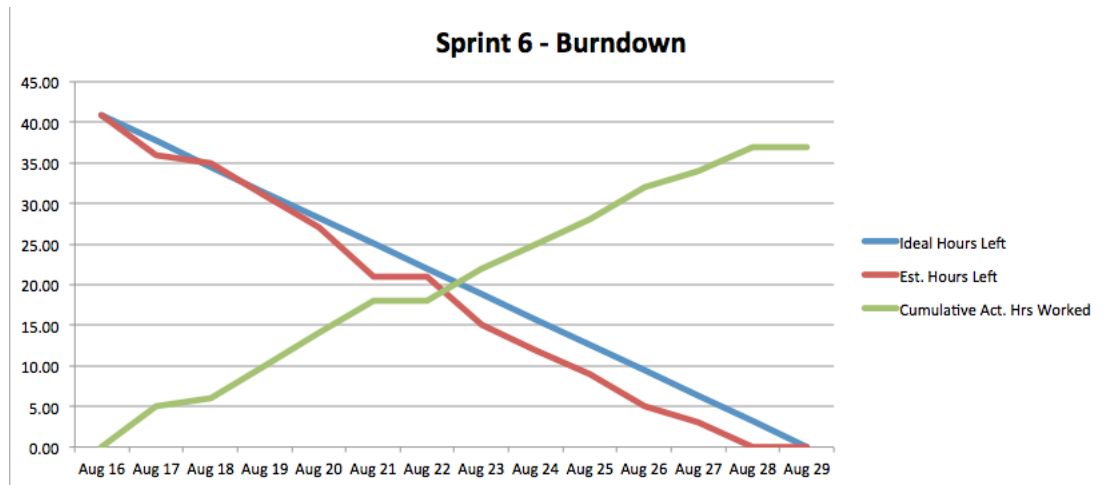


Figure 32. Burndown chart for sprint 6.



## XIV. DISCUSSION

Developing a page based application like the one developed for this thesis can be troublesome. Sending information from one page to another seamlessly and implementing advanced animations for natural avatar movement take a lot of experience. Obstacles like these and whether or not applications like this should include personality are discussed in this chapter.

### *A. Architectural obstacles*

Setting the ground architecture for a complex application is hard and demands earlier experience and practice, for this thesis meaning how to implement scrolling interaction in combination with a page based navigation. This application was supposed to handle horizontal, vertical and scrolling navigation, three basic navigation styles with a lot of tutorials online covering how to implement. Problems occurred when all three were to be combined. They were successfully implemented but the architecture might not be the optimal one with especially a lot of repeated code in order to get the scrolling functionality working.

### *B. Animations*

Creating advanced, amusing and subtle animations is hard and demands a lot of time and effort to implement. For this thesis simple animations were enough to research personality in an application but they could also have been too simple for such a young crowd participating in the usability test. In a modern mobile society users have gotten used to professional animations in their apps. More primitive ones might be seen as boring or even disturbing. Animations can give unsuspected results, as the pie chart in the application was animated at first in order to lure the user to press it - it was ignored and rather looked at as passing of time. Other animations that was assumed to be subtle was instead seen as disturbing - such as the animation of the avatar at the status screen. Animations would thus need to be tested on users to see if their reactions match what is called for.

### *C. Desired improvements*

It is not optimal for a page based application to have menu buttons transit along with the rest of the page when navigating between pages. It would have been visually more appealing if the top menu was excluded from the transition and the buttons would not have to be drawn repeatedly throughout the application. This is part of an architectural obstacle not fully researched during this thesis. The application developed during this thesis is not a complete solution. The prototype need to be extended with connections to a server sending data about the order and account information back and forth. The sign-up page needs to be developed as well, with a correct way of adding billing information connected to the user's account. There is also a need for developing the extension of the delivery map, where the user will be able to locate the driver and their route information while delivering the laundry. An aspect of personality that is not covered during this thesis is sound. If animations, avatars and microcopy text gives a personal experience for the user, it is very likely that sound could be a great part of that experience as well. Further improvements would also be to apply sound to the concept of personality in mobile applications.

### *D. Personal Scrum*

The use of the adaption personal scrum of the origin scrum method proved to be highly useful for this thesis. One person working on their own is hard, especially how to motivate continuous performance. To brake down the thesis in sprints and use burndown charts for each sprint was



great motivational tools and gave an overall perspective on how the work proceeded. It was difficult to estimate how much time to invest in each task but once the initial research and architectural programming was done it became easier and easier to estimate the workload.

#### *E. Personality in an application for ordering dry cleaning*

While some people loved having an avatar bouncing around for a delightful experience others seemed to be extremely annoyed by the same animations. People perceive personality in applications individually, some personality traits might work well on some users while being terrible for others. It was appreciated that the avatar had a different tone depending on the order status. This was a result of trying to adapt the avatar to the emotional state of the user. It was presumed that the emotional state of the user is reflected by how their order is doing. The conversational tone of the avatar could have been improved by for example using the microphone or camera - analyzing facial expression and tone of the user, thus finding their true emotional state. It was clear that the conversational tone with the user was highly appreciated, making microcopy text very useful for inducing a reflectively positive experience handling mobile applications. The use of avatars should although not be completely rejected from this type of service, they could be used in a slightly more settle way. Although most participants wanted the avatar out of this application none gave it a bad score in the survey. If there was a balance in the use of avatar and still not make the application too unprofessional, the delightful experience induced by that avatar could highly affect the reflective positive user experience. Just like it did for a small amount of the test participants in this thesis.

## XV. CONCLUSION

The solution for ordering pickup for dry cleaning that was developed during this thesis proved to be highly user-friendly. Determining what personality that was suitable for this type of application was harder to achieve. The answer to finding that personality is very individual since some users prefer cleaner interfaces and others are very much delighted by the use of avatars. It is important to find a balance between too much personality and an uninteresting application since a reflectively positive experience of an application might get a user to pick one app in favor of another. Human behavior in applications heighten the qualitative experience. Developers should know and analyze their audience for the specific application. Creating the voice of the app should be at least as important as using fast algorithms or a visually appealing design. For developing a great application with a personal user experience there should be resources invested in creating subtle but amusing animations and emotional texts, speaking to the user while also presenting useful information. Even for single-person projects, agile software development methodologies like Scrum can be used and should be encouraged in order to inspire continuous work and to acquire project overview.

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## APPENDIX

### A. Design Guidelines

These images was made by a designer at the San Francisco based tech company. This design gave a first idea on how the application could be designed and function.





MAKE ICONS FOR  
CALL AND EMAIL