The Development of the ShopBuddy: A Team Discovery Channel Original

Assignment G2: User Needs and Analysis

Prepared by Team Discovery Channel:

Phyliss Lee (Phyliss.lee@gmail.com),

Steven Khuu (g7khuust@gmail.com),

Justin Chow (Just.chow@utoronto.ca),

Tong Zou (gofishus@hotmail.com),

Nikola Banovic (nikola.banovic@gmail.com)

Tutor: David Dearman

The Design of Interactive Computational Media - CSC318 - Spring 2009

February 9, 2009

Executive Summary

The research presented in the following document is a composition data gathering and analysis on clothing management. The document accounts for three main phases. The first phase was to design questionnaires and interviews that would enable us to gather data on human behavior in terms of clothing management and to assess the areas of clothing management that demanded an efficient solution. In the second phase, we gathered the data and recorded our findings of relationships from elements in the survey and interview data. A significant result from the process of the second phase was giving our group the ability to identify our stakeholders and users. With the three data gathering techniques, we triangulated consistent patterns from the participants such as style being a more important factor than price or quality, when it came to shopping for clothes. In phase three, we encapsulated the analysis of the findings from the data and produced a persona and scenarios that reflected our interpretation of the analysis. From phase three, we were able to construct the design requirements that would meet the requirements from our stakeholders and users. This will give us an outline for the design of our prototype in the next assignment.

Project participation summary:

General problem – Steve [30 mins], Phyliss [1.5 hours]

Field studies:

- Surveys – Nikola[2 hours], Justin[2 hours], Phyliss[2 hours], Tong[2 hours], Steve[2 hours]
- Interviews – Nikola[30 mins], Justin[30 mins], Phyliss[30 mins], Tong[30 mins], Steve[30 mins]
- I2s – Observations done by James Keane, Muhammad Jalali, Kristaps Ronka
- Summary & research protocol – Tong[6 hours]

Analysis:

- Stakeholder summary – Tong [1 hour]

- Persona – Tong[1.5 hours], Steve[1.5 hours], Nikola[2.5 hours], Phyliss[1.5 hours], Justin[1.5 hours]
- Use cases – Nikola[1 hour]
- Task analysis – Justin[2 hours]

Scenarios – Phyliss [1 hour], Steve [1hour]

Design requirements – Tong [1.5 hours], Steve [1.5 hours], Nikola [1.5 hours], Phyliss [1.5 hours], Justin [1.5 hours]

Composition:

- Title Page – Nikola [15 mins]
- Table of contents – Steve [30 mins]
- Document summary – Steve [1 hour]
- Editing – Steve [8 hours], Phyliss [2.5 hours]
- Appendix – Steve [1 hour]
- Project participation summary – Tong [30 min]

Totals:

Steve 17.5 hours

Phyliss 10.5 hours

Justin 7.5 hours

Tong 12.5 hours

Nikola 7.75 hours

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General Problem & Motivation

Clothing has become a necessity for human survival. It provides warmth, protection, and a means of expression. There is not a person in the world that has not purchased or owned an item of clothing, large or small. The general problem most people in the working world face is how to efficiently manage their clothes. How does one determine what is most important when deciding what to purchase, discard, or wear? Is it simply a matter of comfort and cleanliness or does it go beyond that? Does it matter how much clothes cost? How important is it to be considered stylish? These are all questions that affect the way one chooses their wardrobe and make every person unique with their own style. Having a more convenient way for one to manage their clothes is of paramount importance as every minute saved for this task daily is another 7 minutes saved weekly, and 365 minutes saved yearly. If a user saves 7 minutes from deciding what to wear every day, that is 2,555 minutes or 42.58 hours saved every year! Thus, it is clear that the significance of developing a solution to improving everyday tasks, in this case clothing management, is what motivates us to conduct this project.

This problem is interesting because everybody can relate to it. There is no single best answer to how clothing should be managed. One person may only buy clothes when absolutely necessary, while others will purchase new clothes on a whim. Some people may throw out old or worn out clothes fairly frequently, whereas others might hold on to their clothes forever for sentimental value. Hence, the difficulties that lie ahead of us include answering the question, “Can there be a general solution that will improve the efficiency of most of the population?” We can achieve this goal by taking the general population of stakeholders instead of trying to understand and satisfying scenarios specifically for an individual.

Stakeholders

In a broad perspective, the age range of users for our proposed prototype of a clothing manager varies from ten to sixty-five. However, we must account for the daily tasks and responsibilities of an individual for different age groups. It is fairly obvious that the priorities of a young adult of age 28 differ from that of a young teen at the age of 12. Through the research data that we have conducted, the majority of the results were from the user group between the ages 18-29. More specifically, students within the age range of 18-29. The quantity of data we received from this age group enabled us to find concise patterns, trends and relation between different aspects of clothing management in multiple environments. With this in mind, we decided to choose the students in the18-29 age group to be our primary stakeholders. However, data outside this age group is still significant and must be taken into account as well. The secondary stakeholders (the age group under 18) and the tertiary stakeholders (age groups 30-39, 40-49, and 50-64) provide us with ‘outlier’ data. Although it is not consistent with the general pattern from the primary stakeholders, the data from the secondary and tertiary stakeholders provide some variation, and prose new idea contributions to our prototype. With the ever growing dependency on electronic devices, we found that the primary stakeholder group are the most capable

and the most dependant on using these technologies. Hence, we decided that they would be the most interesting to have as our users.

Assumptions

We are excluding any data or feedback from children ages 10 and under the assumption that they do not go shopping for clothes on their own. Rather, we assume that the parents and guardians of children 10 and under are in charge of purchasing the clothing of the children. Another assumption we are making is that there is no cultural influence in terms of clothing choices. We believe that the every individual conducted in this research is entitled to choosing what they want to wear. For the majority of our stakeholders, we are assuming that they are capable of understanding and using everyday electronics such as computers, iPods, cell-phones, etc…On the contrary, we are assuming that people over the age of 65 are not very tech-savvy. We believe that people over the age of 65 do not have the capability to learn how to use modern-day electronics.

Field Study Summary

Surveys

With over 60 surveys completed, we examined the trends of the results and noticed most of our data came from the 18-29 age group (as seen in figure 1). This corresponds directly to the purpose of having this age group as our primary stakeholders. However, we must also consider our secondary and tertiary stakeholders. After careful examination, we picked the 20 surveys that best represented that similarities and differences we found with our data. Note that the 0% in the pie chart represents the 65+ age group.

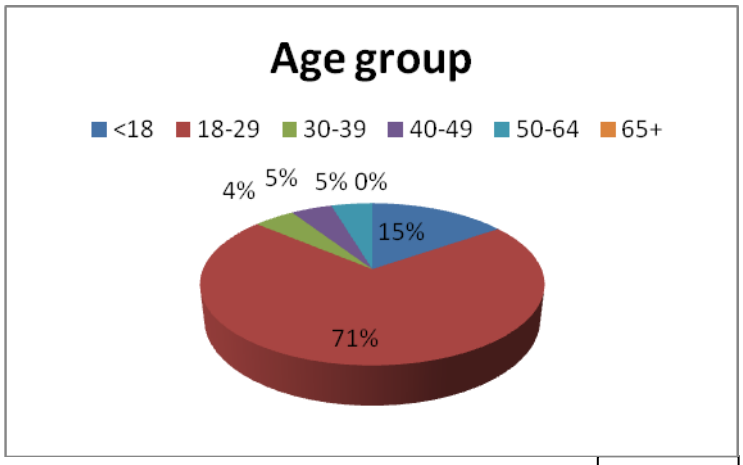


Figure 1

Below is the breakdown and analysis of each age group and the number of people from our "best fit 20" that belong to that age group in parenthesis.

<18 (3): All three had annual income ranges in the "<25,000" section, which is expected since they also checked the "High school or less" section in education and presumably do not have a high paying job as a result. Two had low paying jobs like cashier and waiter and they all spend less than <25% of their income on clothing. In terms of shopping, quality and price were the most significant factors that affected their decisions on clothing purchases. Two shopped out of necessity and one shopped seasonally. All of them stated that they would only discard their clothing if it was worn out or falling apart. However, each person had different uses for their discarded clothes. With weather as the most important factor, all of them decide their clothing the day of. Weather proved to be the most significant factor regardless of setting, be it work, school, or during their free time. All of them had a closet to store their clothing and felt that they had satisfactory, and in some cases, more than enough space for storage.

18-29(12):

<25,000/year (8):

Male (5): One was a high school student, and the rest were in university. Four of them were students and one was a CIBC customer service representative. Out of the factors that influenced shopping, size, style, and price were the factors that were ranked the highest collectively. All of them shop out of necessity, spend less than 25% of their income on clothing, and throw out their clothing when they get worn out. An equal amount said that they would either give to charity or throw out their clothing when discarding. Most chose to wear their clothing the day of, and all of them chose comfort as a deciding factor for at least one setting. Cleanliness and weather were the next most important factors. A majority store their clothing in drawers and said that they had "just enough" or "more than enough" space to store their

clothing. Interestingly enough, one person had checked off all boxes for storage spaces, yet checked “not enough” room for storage. On the contrary, another person checked piles as their storage space and said “just enough” for storage space.

Female (4): Similarly to the male group, one was a high school student and the others were in university. As shown in figure 2, the percentages of the 65 participants in each educational level are fairly close to the distribution that we see within this age group. OF the four females in this subgroup, one was a software developer and the rest were students. Style and quality were the factors that were ranked the highest collectively. An equal amount shopped when there is a sale or seasonally. One spent <50% - 74% of their income while the others spent <25% of their income on clothes. An equal amount threw away their clothes when they were worn out or doesn’t fit them anymore. All of them chose to not throw away their clothes, and instead opt for charity or hand-me down. An equal amount decides to wear their clothing the day before or day of. In the workplace, at school, or on their free time, all settings showed that comfort, style and cleanliness were the most significant factors. All of them had closets, yet half of the women believed that this was “just enough” space while the other half believed that this was “not enough” space.

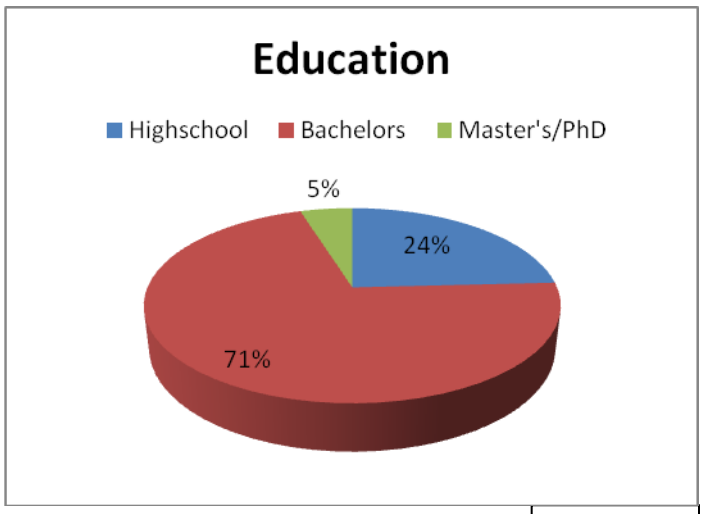


Figure 2

25,000-100,000/year (3): All of the subjects were female and all held a professional occupation. In terms of shopping, there was a consistent agreement on style and size being the most important factors when purchasing clothes and shopping only for necessities. All of them

discarded their clothes at different times, but chose to give to charity. All of them planned their clothing the day of, with style being the most important in work settings and comfort the most important in free time and school settings. Although two of the three women had cabinets, they all said that they had "not enough" room for their clothing.

30-39(3): All of them had income ranges between 25,000 – 50,000 where as some were holding a bachelor's degree. This selection contains two males and one female. Although all of them shopped at different times, they all rated quality as most important. A majority spends less than 25% of their income on clothes. Looking at the trends from our sample data, the 18-29 age group and this age group, show that the <25% income spender majority is also seen in the plotted data of the all participants in figure 3. All of them choose what to wear the day of, with comfort being the overwhelming factor and cleanliness being secondary. The type of occasion was also cited as another factor that affected their clothing choice. All of them had cabinets or drawers to store their clothes, but two of them said they had "not enough" room.

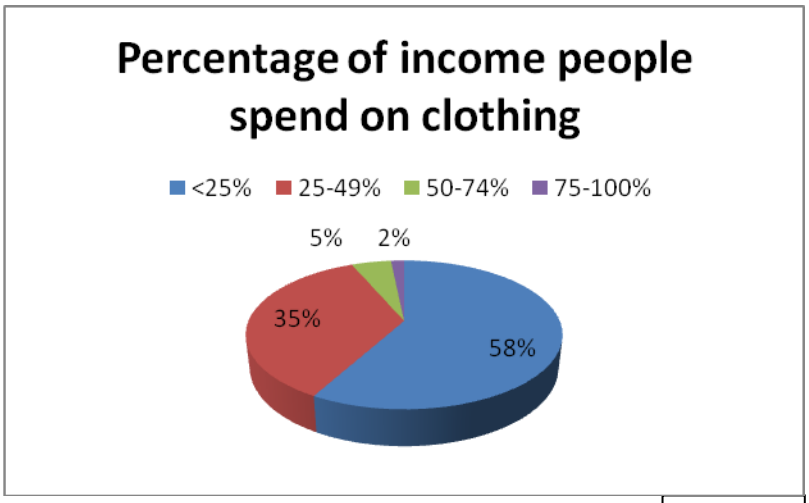


Figure 3

40-59(2): There is one of each gender in this category, with both of them making over 25,000/year and having a bachelor's degree. Style proved to be the most important factor shopping out of necessity and seasonally, spending less than 25% of their income. Both chose to give their clothing to charity once they are worn out. For both subjects, cleanliness is the most important factor in a work setting, while comfort is the most important in the other settings. Both of them have cabinets and drawers and say they have "just enough" room.

Interviews

Conducting five interviews in total, we designed the interviews to give us more insight into how people manage their clothing. We focused on this aspect because our project is designed primarily for the interaction between the home the task of shopping. All interviews were conducted face-to-face in either a home setting or a school setting. Our general interest turned to the primary stakeholder age group (18-29). Listed below is the summary of the responses we received from each question:

When do clothes get out of style? Participants felt that it varied depending on their need to go shopping for new clothes. The more they felt that the more they wanted to shop for new clothes, the more they felt that their clothes were becoming out of style. They mentioned that there was no definitive time for when clothes go out of style.

Celebrity influence? All participants mentioned that celebrities did not play a large influence with their choices of clothing. However, some mentioned that once in a while they might take a look in the magazine to find the newest trends.

Sorting clothes? Each person sorted their clothing by different categories. Two people sorted by type (sweaters, pants, etc), another sorted by setting (casual, business, etc), and the other two people sorted by season (summer, winter, etc). It is clear that there is a definitive pattern between the organization of each person and what they decide to wear each day. We noticed that no interviewee sorted their clothes in a random order.

Brand-quality relationship? All participants acknowledged that there was a relation between quality and brand. Some brands have a reputation for consistent quality while others were more hit-and-miss. Moreover, the participants felt that brand established trust, entailing that consumers will be loyal enough to buy from the same brand multiple times.

Factors determining whether clothing is acceptable to wear outside the house? The answers here co-relate with the options on the survey, including factors such as weather, comfort, cleanliness, occasion

and style. However, by relating these interviews to the survey data we discovered that the significance of these three factors varies between age groups.

Difference between work/school/free-time clothes? A majority of participants said that work clothes were in general more conservative and formal while school clothes are more casual and comfortable. Free-time clothes tend to vary depending on occasion.

Shopping online? All participants mentioned that the largest drawback to shopping online is the inability to try the clothing on. Some benefits participants mentioned are that there may be cheaper variations of clothing online.

Purchase financing? Most participants shopped using their own money. However, those who received money from their parents mentioned that they felt that they had more freedom in purchasing clothes. This freedom did not necessarily lead to more spending.

Trying on clothes? All participants mentioned that they usually try on clothes before they buy them, except for certain items such as t-shirts and underwear. In the cases where the item of clothing was purchased without trying it on first, the common action was to return the item back to the store.

Decision-making? Four of the five participants felt that their decisions on purchasing clothing were completely independent. One participant felt that it was necessary to include their friends' opinions when deciding whether or not to buy a certain item of clothing.

Washing clothes? Most participants have a washing machine at home and wash their clothes about once a week. The common factors that determined when clothing needed to be washed were the look, feel and smell. In addition, the type and style of clothing people wear also factor into how often they washed it. 'Flashier' clothing (dress shirts, dresses), considered more noticeable than 'normal' clothing (t-shirts, jeans), were washed less often than 'normal' clothing because of the tendency to not wear the 'flashier' clothing for continuous days.

Factors determining whether clothing is good enough for charity? All participants had a general consensus that when a piece of clothing is in decent condition, and they no longer wearing it, then it is fit for charity. Otherwise, if it is too dirty or in bad condition, it gets thrown out.

Observations

For our observations, we took a look at five I2s from other classmates. In particular, we focused on those observations made by Kristaps Ronka, James Keane, Mohammmad Jalali, and YuChor Lam These I2s were picked for their wealth of data and relevance to our purpose.

Kristaps Ronka: She made her observations based upon random strangers in a shopping mall. The summaries based upon her data are as follows:

Figure 4

Influences when buying clothes: Style is an important factor and people decide whether it is unique, appropriate for age, and whether it will look good on that person. This clearly compliments our data from our participants. As we can see in figure 4 almost half of the participants of our survey felt that the style of clothing was the most important factor. Brand seems to be closely tied with fashion and those who are more fashion-conscious are also more brand-elastic. Cost is closely tied with quality, as people tend to spend more if they know they are getting more bang for their buck. Tradeoffs often concern the relationship of price and quality and how often it would be worn.

Influences when discarding clothes: Whether the clothing has become outdated, or no longer worn plays an important factor in when people throw or donate their clothes. Cost also plays a part as it is harder for people to throw away more expensive items.

Influences when deciding what to wear: Weather is very important to what people decide to wear. The event or occasion is also a factor to what people wear.

James Keane: He conducted his interviews with three different subjects, all of them female, with one aged 40-49 and two aged 18-29 to determine their habits on how they wash their clothes. The summaries based upon his observations are as follows.

Daily clothing choices: Mood, weather, occasion are often the deciding factors for deciding what to wear. Challenges include finding a specific item and a limited clothing selection.

Purchasing clothes: Factors include trends, style, season and social events. The challenges are often cited as not having enough time to look around or not finding the right size. Price and selection are also big factors when buying clothes.

Discarding clothes: People generally throw out their clothes when their clothes don't fit are damaged or when they just don't like that article anymore.

Washing clothes: Most people have a washing machine and separate their clothes by style and/or appearance before washing it.

Mohammad Jalali: He conducted his observations while shopping with his friends. Two were female, one male, two were in the age group 18-29 and one in 40-49. The following summary concludes his observations:

Shopping for clothes: Factors that influence how people buy their clothing includes price, brand, season, style and size. People tend to be more attracted to a piece of clothing when it is on sale. A better brand often justifies a higher price. The season indicates what type of clothing people will buy, and style goes along with how well it matches with that person's other clothes. Size is important because people

usually buy clothing that fits them. Furthermore, most people wanted an opinion of how a piece of clothing looked on them before buying it.

Organizing clothes: Everyone that was observed organized their clothes according to some sort of criteria with the most common being season and style. Both male and females organized them in this manner, with older clothes often being in a separate location. **Discarding clothes:** Most people don't like to throw away their clothing, either because they decide to give them away to charity or decide to keep them for nostalgic reasons.

YuChor Lam: He conducted his observations on three university students shopping for clothes online. His observations (in combination with information we gathered from interviews) gave us insight into challenges that people are facing when shopping online, such as: not being able to try items on, discrepancy between advertized colors and sizes and the actual sizes and colors of items, etc.

Summary

Based upon our observations, surveys and interviews conducted; there are several details that can be extracted from this research. The findings remained fairly consistent. Even with the data in comparison between sexes and age groups, the variation in the data did not show large fluctuations or changes. The same factors that held true for younger people generally held true for older individuals and for both sexes as well.

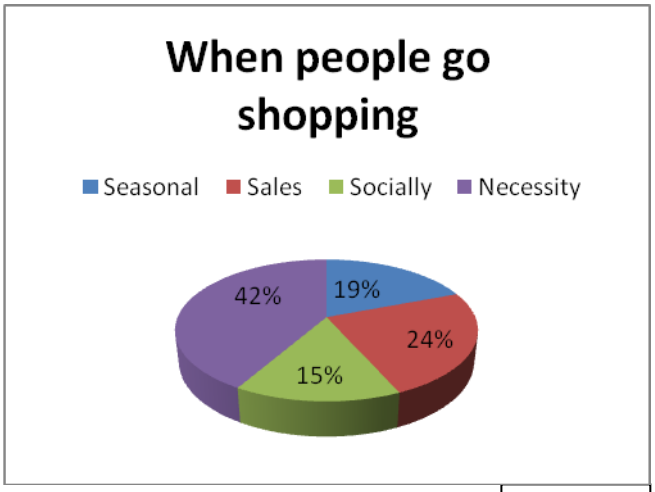


Figure 5

Shopping: Between all age and income groups, size, style, and price seemed to hold true as the largest priorities. In the income ranges <25 000 and 25 000-50 00, one of their top three priorities was always price. In comparison, those who thought brand associated with price and quality, tend to rank quality

higher and price slightly lower. Necessity and seasonal were overwhelming factors in determining when to shop, with many people adding in that they shopped whenever they found something the liked. We can see from figure 5, our field summary sample analysis directly correlates to the behavior of shopping frequency found with the plotted data of all of our participants. Females often try on clothes before buying them. This gives us a suggestion as to why almost all our interviewees turned away at the thought of online shopping. Celebrity influence was not deemed important. A majority of females felt that their decisions on their clothing choices were to be made independently.

Management: A majority of participants decide to wear their clothing the day of, although there were several females who like to lay out their clothing the day before. People tend to wear comfortable clothes in school and free-time settings and tend to wear more conservative, clean and presentable outfits in the work-setting. Weather is an overall important factor in all settings. Many participants added that that occasion and events play an important role as well. Almost all participants own a washing machine and wash their clothes once it looks dirty or smells bad. Females and people in the upper income range tend to have ample space to store their clothes, yet still have consider the space to be “not enough” or “just enough”.

Discarding: Almost all the participants decide to discard their clothing when it gets too worn out. In addition, most females said they discarded their clothing when it doesn’t fit them anymore or when they don’t wear it as much anymore. A strong majority of participants donate to charity and Goodwill when their discarded clothing is in decent condition. Cost and nostalgia may be reasons for why people do not like to discard their clothing, with some people mentioning that they never discard their clothing at all. Some participants mentioned that they never discarded their clothing. They felt the need to keep their clothing for sedimentary reasons or reflecting on the cost of purchasing certain items of clothing.

Analysis

Stakeholder Description

The field study summary suggests that the behavior of how people manage their clothing was different depending on their circumstances. Our research also indicates that a majority of people prefer to decide by themselves, and designing a user interface that could efficiently help people with this task would be quite difficult. Furthermore, the style of every individual is different and there is no guarantee that any software/user interface used will actually decrease the time and effort taken to sort and manage clothing. We also learned that a significant number of our participants don't actually throw away their clothing. This is another aspect that would be quite difficult to develop a solution for.

In consequence, we decided to focus on the aspect that projected more stable data. The shopping aspect proved to be an easier alternative in gathering survey data and recording observations. Our studies suggest that although people go shopping for various reasons (such as seasonal, necessity, sales signs), the majority of the participants said that they spend most of their time finding clothes that are the right size, style and price. Additionally, from our interview we realized that a brand-quality relation does exist. People who were concerned about quality were also concerned about the brand. Most people like to decide for themselves and have their own style. Taking everything into account, our design will focus on the user group in which we have the most data for (18-29) as the primary user group, with age groups (10-17) and (30-65) being our secondary (and possibly outlier) user groups. Our primary user group exemplifies many of the qualities we had concluded from our field studies, faces many of the same challenges and are the most likely to be in need of our product. Thus our persona will be the archetypal primary user that we are designing for.

Primary Persona: Amanda Lee

"I want to have fun when I go out shopping."

Amanda is a 23 year old, Chinese born Canadian, pursuing a degree in Sociology and a minor in Fine Arts. She's currently working part-time as a waitress, but is actively looking for a co-op job in social work. With her busy schedule she has to stay organized and on top of things which she manages by having a strict routine.

Her Google Calendar is always up-to-date and synchronized with her iPhone (a present she got from her parents for her 23rd birthday). She uses it to plan everything from her workouts to dinner with friends. If she could only afford a personal assistant, she wouldn't have to type in all those events by herself. Amanda dreams of moving out of her parent's home. She feels her bedroom is too small, not to mention the very limited storage space. Although she has a closet and a drawer in her room she still feels she doesn't have enough space to store all her clothes. She hates piles of clothes she creates on the drawer and chairs in her room. She likes to have her things clean and organized, separating her laundry-fresh clothing from her dirty and damaged clothing. Her extremely hygienic habits are a joke to her friends.

Amanda is very conscious about her looks. She insists on dressing fashionably appealing for almost every occasion and avoids wearing the same outfit too frequently. She takes pride in picking her own clothes and only in rare cases takes advice from others about what to wear. Her decision about what to wear is always influenced by her surroundings. She likes nothing more than to change into her sweatpants when she's at home. For school, she usually goes for combination of comfort and style. On the other hand, Amanda works at a restaurant where the waitresses are required to wear a uniform. While at work, her clothing options are restricted to black pants and a white collared shirt. Although her part-time job pays fairly, Amanda is currently going through multiple interviews for co-op positions for

social work at different facilities. She prefers style over comfort and is ready to go out of her way to look professional. She picks clothes according to what is appropriate for the interview setting and the weather.

Amanda enjoys shopping with her friends. They would go to malls, search for new stores, look for sales, give each other advice on different clothes, and point out ridiculous items. They spend most of their time in stores that carry their favourite brands and where they have had an enjoyable experience shopping in the past. She strongly believes that there is a connection between brand and quality so she avoids brands that have bad reputations for quality.

Under small time constraints, she wants to make sure she gets clothes that she needs without too much hassle. Either way, she doesn't want to waste her time on stores that do not carry styles she's looking for or stores that carry clothes that are way over her budget. Her budget is limited to income she gets from her part-time job. Sometimes when she shops with her friends, Amanda gets carried away and spends more money than she should and gets in trouble with her parents. She often finds that a quarter of her pay from the part-time is spent on purchasing clothing. The only thing that spoils the fun of shopping is when she can't find anything she likes and spends hours searching for stores that she likes. The thought of online shopping aggravates her. She has had unsatisfactory experiences in the past ordering clothes online. The clothes she received from these online stores ended up not fitting her or looked different than what she expected.

Essential Use Case

Online Shopping

User Intention	*System Responsibility*
Navigate to an Online Store (Website)	Display home page
Click on a product category	Display subset of products in the category
Sort products by price lowest to highest	Display products in the same category sorted by price

Click on a link to see details about a product from the list	
	Display product detail page
Select color and size, and add to shopping cart.	
	Present user with a checkout screen

A traditional use case for buying clothes online.

1. The user enters a store website and navigates to the online catalogue.

2. The user selects the types of products they are looking for by dropdown list of categories provided by the website.

3. The user refines the catalogue further by selecting the 'sort by price' option.

4. If the user is interesting in any item from the resultant catalogue:

    4.1 - the user can click on the link of the item to view more information

    4.2 - if the user does not see any item they like from this category, they proceed back to step 2.

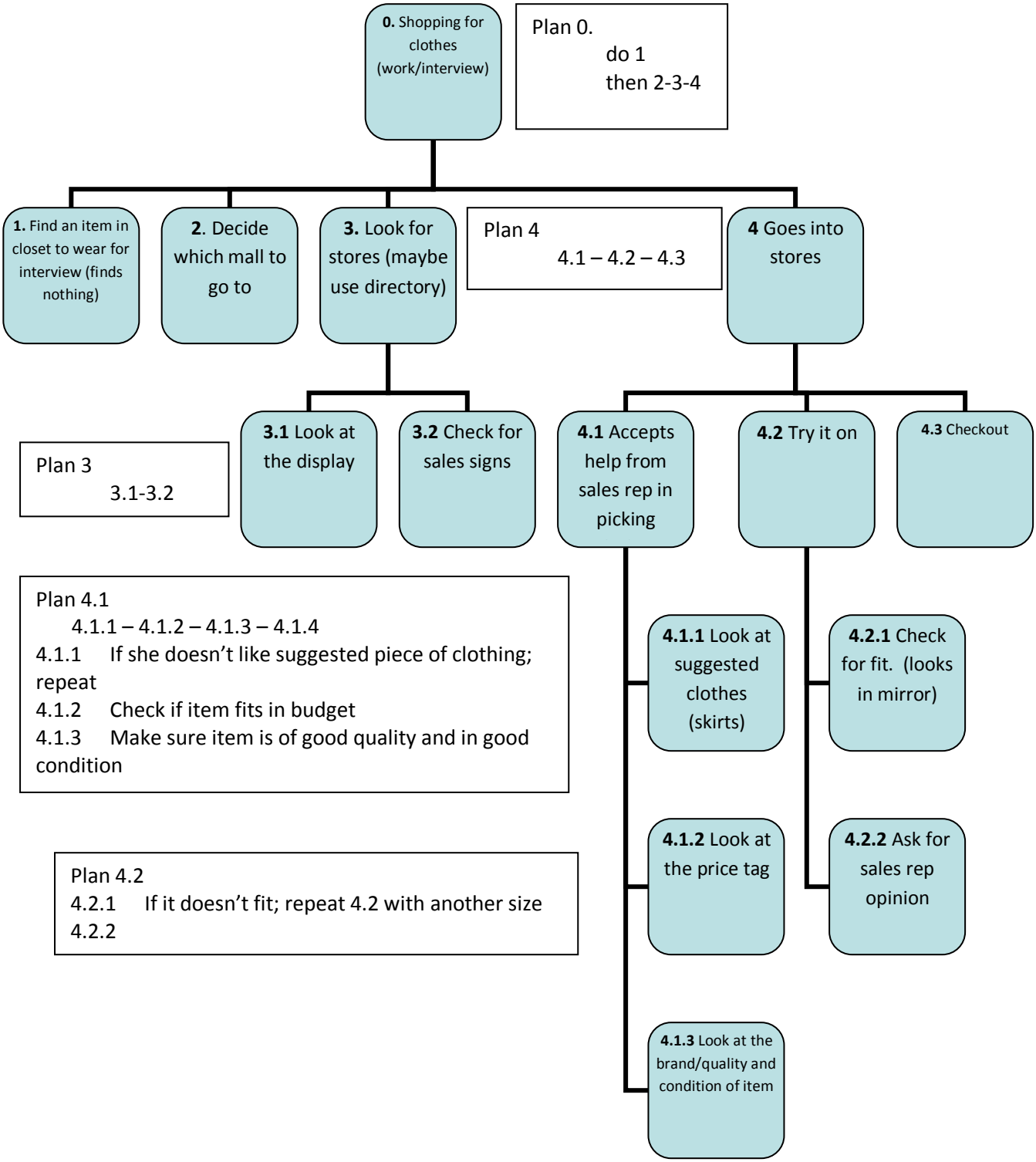
5. If the user is interested in purchasing an item:

    5.1 - the user checks for availability, selects the colour and size, then click to go to the checkout

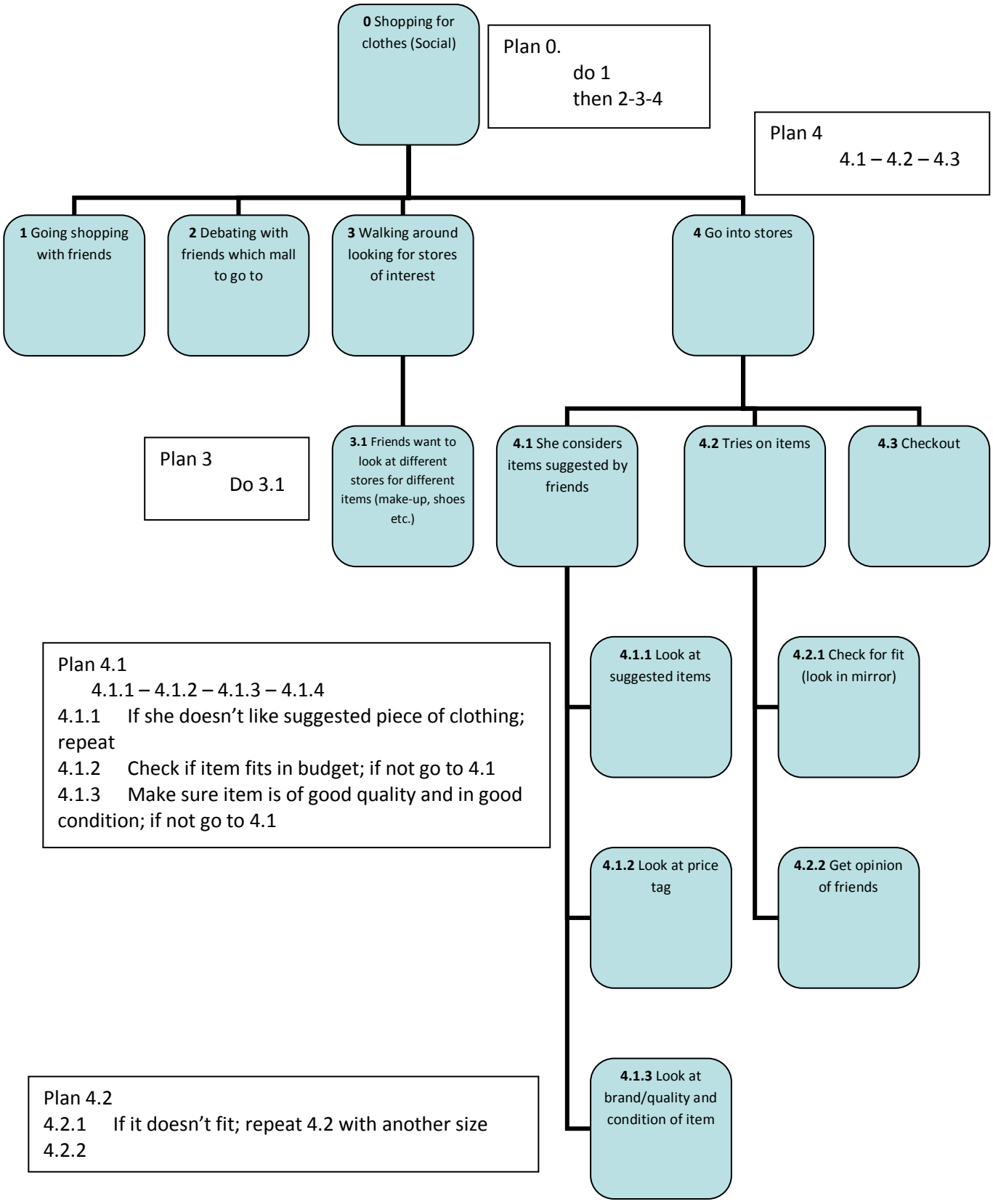
    5.2 - if the user does not like the availability or pricing of an item, they proceed back to step 3

Task Analysis

Shopping for clothes alone:



Shopping for Clothes with Friends:



Scenarios

Shopping alone

Amanda is a 23 year old undergraduate student pursuing a degree in sociology and fine arts. She is currently trying to find a full-time job for the summer and needs a business suit to wear to her interviews. She goes online to find the closest mall that has most of the stores that she wants to go to. She finds one that is only fifteen minutes away by bus and decides to go there.

Once there, she consults the mall directory to find exactly where the stores are that she is looking for. She also plans an efficient route to go to each store without too much backtracking. When she's happy with her proposed plan, she head into the direction of the first store. She notices that there are large sale signs in the window and smiles as she enters the store hoping to find a good deal on a pant-suit. Once inside she is greeted by a store clerk who asks if there was anything in particular that she was looking for. She replies and asks if the store carried any pant-suits in her size. She figured this would be faster than looking around herself. The clerk walks off and returns a few moments later empty handed. He told her that they had sold out of every pant-suit in her size and apologizes. The clerk then suggests some other stores that she could try in the mall. Amanda takes note of their advice and leave somewhat disappointed.

Amanda heads to the next store on her list and enters. This time, to save even more time, she approaches an employee and asks if they had any pant-suits in her size. The employee replies "yes" and asks her to follow them to where they are located. Once there, Amanda sees several that she likes and picks them out to try on. The employee escorts her to the change rooms and tells her to notify the staff if she is in need of any assistance. Amanda tries on all of the outfits and checks to see how they look and feel in the mirror. She really likes one in particular and checks out the price tag. It was slightly out of her price range, so she asks an employee if there were any further reduction on that particular item. They reply, "No". Unsettled, Amanda debates with herself over the worth of these items and decides

that it would be a good investment since she will be wearing it to several interviews and could also wear it to work once she lands a job. She decides that she will purchase the items and heads to the cashier. She pays the full amount and heads home satisfied that she purchased exactly what she was looking for.

Shopping with friends

Amanda is feeling rather stressed from balancing her part-time job and keeping up with her readings for Sociology and Fine Arts. Her friends convince her to take the weekend off to go clubbing to relieve some of the stress. As a group, they decide to go shopping to look for new outfits to wear for Saturday night. However, they are bored of heading to the same mall time after time and decide to find a new mall to go to. Amanda pulls out her laptop and jumps straight to Google Maps. She types in "malls near 250 St. George, Toronto" and Google Maps returns her a map with pointers of the closest malls within a ten kilometer radius. She finds two malls that are within walking distance of her home. However, one of her friends notices that the information is outdated. One of the malls that are within walking distance was scheduled to be torn down on the following Monday, yet Google Maps did not specify anything about the construction operation. They decide to go to the other mall, but none of them have ever been there before. Concerned about what stores the mall has, Amanda decides to click on the link to the mall's website. Navigating through the website, she finds the list of stores that the mall has. Her friends recognize some store names and are curious about the current inventory of these stores. However, the website only provided the list of stores and their respective locations in the mall. After drawing out a map of the places they planned to visit, Amanda closes her laptop and the group of friends head for the mall.

With the planned route, they are quick to recognize the familiar signs and logos of the stores they planned to visit. At their first stop, they notice that the mannequins had some very attractive attire that some of the girls wanted to try on for themselves. As an additional incentive, the store had a large clearance sale poster on the display. They decide to browse around the store, picking up items that they

each find attractive. Without hesitation, they rushed into the changing rooms to try on the clothing. Amanda receives compliments from her friends about her choice. She can't help but admire the look. Quickly flipping over the tag to check the price, Amanda is disappointed to discover that this dress is three times the price she had expected to pay. Her friends acknowledge her disappointment and decide to try to find a similar dress in different stores. Her friends go through several stores before finding something quite similar to what Amanda had tried on earlier. Amanda rushes to the change room to try it on. It had the exact same fit as the dress from the first store. Again, she flips the tag over to reveal the price. She is more than ecstatic to find out that the price of this item was less than what she wanted to pay. Without hesitation, she takes the dress and proceeds to the checkout. Now, it's her turn to find clothing for her friends.

Design Requirements

Purpose of design

To make it more convenient for people to shop for clothes, and aid them in saving time and money when choosing outfits. We want to design a device that contains portable software that will appeal to the age group (10-65), with special focus on people aged 18-29. This prototype will be able to locate nearby stores and acquire information from those stores such as current inventory and sales.

The software is versatile. To eliminate the frustration of consumers having to carry around another gadget, the software can be ported onto and used any touch screen device / smart-phone. The device itself will have a consistent wireless internet connection. What this means for the user is that there is no place where this device cannot be used. The user does not have to worry about poor reception underground, especially on a subway train on the way to a mall.

The objective from making this device is to integrate tasks and duties associated with clothes shopping into one unit. This will help minimize the time users waste on performing tedious and repetitive tasks such as checking on availability of certain clothing in stores, filtering through clothing

that user would prefer, and locating stores. As an added feature, it will eliminate the panic-driven task of finding sales receipts by storing sales records as data on the device.

Based on our field summaries and analysis of our stakeholders, use cases and persona, these are the requirements we have come up with:

Functional requirements

- **Provide locations and directions to the store:** The user needs to be able to locate the stores automatically, because it saves time from finding the store manually.
- S**earch for stores that stock inventory that fits with the user's preferences:** Based on our observations, style, size and price are the most important factors. The user will be able to input these factors as preferences so that the software can filter search results tailored to the user's needs.
- **Provide localized and context-dependent messages on different products and sales:** The software should be able to find the user and notify them when new products and sales are available at the store they are currently in.
- **Store and manage user preferences:** This is necessary for interaction as the user needs to put in their data in order to receive information from stores.
- **Provide directions in emergency cases**: In case of fire and natural disasters, the user needs to be notified of a path to safety.
- **Allow users to reserve clothes to try on at a specified store:** User should be able to request to try on a piece of clothing. The request will be sent to the store and the store puts the user on a queue until a clerk is available to arrange the clothes for the fitting.
- **Store purchased items history and their sales receipts:** By storing transaction histories, this will eliminate the frustration of lost receipts for users in the case that they want to return an item.

- **Support for multiple languages:** Necessary in order to expand software to multiple devices in multiple countries.

User requirements

The user requirements were derived from the functional requirements. Thus, the points made below can be elaborated from the description in the functional requirements.

- Locate stores that fits the user's preferences (style, size, price, etc)
- Receive information related to sales and events
- Notify about the availability of items
- Be able to switch languages
- A list of items to buy or try on
- Schedule to try on a piece of clothing and reserved on a waitlist at that store

Usability requirements

- **Voice recognition:** For the purpose of enhancing the interaction between the user and the prototype.
- **Low cost:** Cost needs to be minimized such that adoption rate and user base will grow faster.
- **Simple to use with minimal data entry:** Using simple interfaces (e.g. Google) is necessary to satisfy our outlier case users (10 years old, 65 years old).
- **Fast, real-time updating:** Necessary to obtain accurate and up to date pricing and information.
- **Provide adjustable notifications**: Users should be able to set the level at which they want to be notified (e.g. sales, new items, message or voice, etc) in order to minimize annoyance.
- **Help options:** If a user needs to troubleshoot or a bug happens in the software, a user should be able to receive support for it (e.g. documentation, live help, FAQ).

Environmental requirements

- **Device does not suffer from bad reception:** In order to improve the convenience of the prototype it must be accessible at all times regardless of the location (e.g. underground).
- **Waterproof:** Depending on the hardware, the device should be able to be used regardless of surroundings, including rural surroundings which may contain water and bacteria.
- **Easy to access and maintain**: User should not be expected to clean the screen, use a fan to cool the device, or fix errors every time they use the software.

Technical requirements

- **Support for a variety of platforms including mobile phones and touch screen devices:** We want to reach our primary user group (18-29), a majority of which use mobile phones and/or touch screen devices as well as support for other devices.
- **GPS:** Necessary in order to provide store location and emergency directions.
- **Bluetooth:** Necessary for hands-free operation or for in-car use.
- **Wi-Fi, 3G + 2.75G support:** Since this device needs to provide online functionality as well as interface with the store software, wireless, and fast transfer protocols need to be used.
- **Built-in speakers, optional headphones:** Necessary for those who are visually impaired or want to increase level of notification.
- **Microphone:** An additional level for users to input and interface with the device/software.
- **Fast processor and memory support:** Our primary stakeholders are young and can be impatient. Thus, a fast processor and a large amount of memory are needed to keep their interests.
- **Stores will integrate their inventory databases with separate versions of software:** In order for our software to know about inventory, sales and new products, the store needs a special version of the software. The software should be able to access internet and interface with the software at each store.

Appendices

Field Study Protocol

1. **Project Title**: Interviews, Observations and Surveys of how people manage and wear their clothing.

2. **Investigators**:

Tong Zou – tong.zou@utoronto.ca

Steve Khuu – g7khuust@gmail.com

Nikola Banovic – nikola.banovic@gmail.com

Phyliss Lee – phyliss.lee@gmail.com

Justin Chow – just.chow@utoronto.ca

3. **Purpose**: The purpose of our research is to understand how people currently manage their clothing to help us derive requirements for the design of novel interactive computational media that would alleviate the problems and inconvenience associated with this task (this is covered in General problem in more detail). Generally, our product is intended to be useful to people in the age group (10-65), but because a majority of our research was conducted on people age (15-29), that is the user group that our design will perhaps appeal to the most.

4. **Process to be followed**: We will brief the participants about the purpose of the study, explain the consent form to them, and ensure that they sign the consent form. We will then engage the participants in a short survey and selected a few for a semi-structured interview. We will also with their permission make observations as follows: Our choice of I2s were varied, we have three I2s by James Keane, Mohammed Jalali, & Kristaps Ronka. James Keane performed his observations at his subject's homes, Mohammed did his while shopping with his subjects and Kristaps did hers on random subjects at a shopping mall. The observations were followed optionally by an interview with the subject in whom they describe their thought process and their preferences.

5. **Participant selection:** Observations and surveys were taken on members of our family, our acquaintances and random people that seem to fit our stakeholder group. The interviews were conducted on family members and acquaintances.

6. **Relationships**: Our relationship to the participants may be described as follows: family, friends, acquaintances, and in some observations (Kristap's I2), strangers.

7. **Risk and benefit:** There will be minimal risk to the participants, for example that they feel that they have wasted their time. The only benefit will be to contribute to the education of the investigators and for the benefit of gathering research for this project. Participants are free to withdraw before or at any time during the study without the need to give any explanation.

8. **Consent details**: We will brief the participants about the purpose of the study, and explain the **attached consent form** to them, and ensure that they are willing to participate and sign the consent form.

9. **Compensation**: Participants will receive no compensation.

10. **Information sought:** We want to procure data relating to the participant's clothing habits, shopping habits & wearing habits. We want to follow the decisions participants make when performing each task. Demographics and income are also important to our research as we want to design a product that has a broad appeal and reasonable affordability. These are all necessary in order to design a product that can maximize a user's convenience and benefit and can be suited to accommodate general habits or decisions that a user will usually make.

11. **Confidentiality**: Information will be kept confidential by the investigators. Names or other identifying or identified information will not be kept with the data. The only other use will be to include excerpts or copies in the assignment submitted, but names and other identifying or identified information will not be submitted.

Questionaire

DEMOGRAPHICS

Age Group: <18 18-29 30-39 40-49 50-64 65+

Annual Income Range: <25,000 25,000-50,000 50,000-100,000 100,000+

Gender: Male Female

Education Currently Pursuing: ☐ High school diploma or less ☐ Bachelor's degree ☐ Master's and/or PhD ☐ Currently not pursuing

Occupation: _____

SHOPPING:

Prioritize the factors from 1 to 5 (where 1 is the most important) when purchasing clothes:

price __ size/fit __ brand __ quality __ style/appearance __

When do you decide to go shopping? (Check all that apply)

☐ Seasonal ☐ Sales ☐ Socially ☐ Necessity

What is the percentage of income do you or are willing to spend on clothes? (Check one)

☐<25% ☐25-50% ☐50-75% ☐100%

DISCARDING:

When do you decide to throw out your clothes? _____

What do you do with discarded clothes? (Check all that apply)

☐ Hand-down to Sibling ☐ Give to Goodwill/charity ☐ Throw out ☐ Other (Specify) _____

WEARING:

When deciding what to wear in the morning, are your clothes laid out beforehand or chosen the day of?

☐ Yes ☐ No

Prioritize the factors from 1 to 6 (where 1 is the most important) when deciding what to wear:

Work Setting

Comfort__ Weather__ Style__ Cleanliness__ Mood__ Other (Specify) __ _____

School Setting

Comfort__ Weather__ Style__ Cleanliness__ Mood__ Other (Specify) __ _____

Free time Setting

Comfort__ Weather__ Style__ Cleanliness__ Mood__ Other (Specify) __ _____

STORAGE:

How much space is available for your personal clothing storage?

☐ Too little ☐ Just enough ☐ More than enough

How do you organize your clothes? (Check all that apply)

☐ Walk-in Closet ☐ Cabinets ☐ Drawers ☐ Piles

Interview Questions:

Style:

- How do you determine if your clothes are out of style? How often does that occur?

  - How important is celebrity influence?

- How do you sort your clothes? (season, colour, etc…) Describe your clothing space.

- Do you think that there is a brand/quality relations?

- How do you determine if clothing is acceptable wear outside the house?

- What's the difference between work/school/free-time clothes?

Shopping:

- How often do you shop online for clothes? What are the benefits or drawbacks to shopping online?

- Who finances your purchases?

  - If you get money from your parents, do you tend to spend more? Do you care less about price?

- Do you try on clothes before you purchase it?

  - If not, what do you do if it doesn't fit?

  - if sometimes, what factors could cause you not to try it on before purchasing the item?

Wear:

- Would you prefer to have somebody aide with the decision of what to wear? Or make the decision alone?

Management:

- Describe how you wash your clothes. (Laundromat, dry cleaning, at home washer and dryer, etc…)

  - Describe how frequently you wash your clothes. Is there a relation?

- How do you determine if an article of clothing is dirty?

  - Describe the process of determining what clothes are ready to be washed.

- What factors determine whether you should throw out clothes or give it to charity or hand-me-down?

Interview Protocol:

- Choose a private location to conduct interview
    - At their respective homes, in their bedrooms.
    - The interviewer and the interviewee are both seated in chairs facing each other
    - Performed interview at 8pm, to establish a relaxed setting
    - Ensured that the interview was performed during a quiet state of time to eliminate any sort of bias from outside interference
- Invite participant
- Brief them on the project
- Get participant to sign interview consent form
- Begin semi-structured interview – following general questions exactly, deviating if more information is necessary
    - If the participant doesn't answer the question properly
    - If the answer opens up an interesting area for new questions
- Transcribe answers into laptop document or write in notepad
- End interview – ask participant for any closing remarks

Consent Form: Clothing Management Survey

I hereby consent to participate in a research study conducted by Stephen Khuu, Tong Zou, Phyliss Lee, Nikola Banovic, Justin Chow for an assignment in University of Toronto Computer Science 318, Design of Interactive Computational Media.

I agree to participate in this study the purpose of which is to analyze the way in which people manage their clothing.

I understand that

- the procedure to be used is a survey.
- I will receive no compensation for my participation.
- I am free to withdraw before or any time during the study without the need to give any explanation.
- all materials and results will be kept confidential, and, in particular, that my name and any identifying or identified information will not be associated with the data.

Participant

Name (please print)_____

Signature_____ Place and Date _____

Investigator(s)

Name (please print)_____

Signature_____

Consent Form: Clothing Management Interview

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Participant

Name (please print)_____

Signature_____ Place and Date _____

Investigator(s)

Name (please print)_____

Signature_____

I2's used:

"Clothing Management Study" by Kristaps Ronka

(http://www.cs.toronto.edu/~khai/classes/csc318-spring2009/submissions/I2-Ronka.pdf)

"Observation of current clothing management techniques" by James Keane

(http://www.cs.toronto.edu/~khai/classes/csc318-spring2009/submissions/I2-Keane.pdf)

[Untitled] by Mohammad Jalali

(http://www.cs.toronto.edu/~khai/classes/csc318-spring2009/submissions/I2-Jalali.pdf)

"Observing People Performing a Task" by YuChor Lam

(http://www.cs.toronto.edu/~khai/classes/csc318-spring2009/submissions/I2-Lam_Y.pdf)