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User Centered Requirements Analysis and Design

Introduction:

This document attempts to analyze the requirements of a task that an employee of the Bike Program at the University of Oregon performed to plan, organize and conduct an event. Interviews have been conducted and a hierarchal task analysis was built based on the methods the employees described how they did the whole task. A problem scenario is also written based on this information as well.

Scenario:

A) *Jack comes up with an idea of a bike event:*

Jack Blashchishen, a student employee at the Bike Program, comes up with an idea of organizing a bike event and so, he starts thinking about the high-level information about the event. The first thing he does is that he finds out a nice title for the event. Since the main idea was to help people to show the bike routes in Eugene, he decides the title "Intro to Biking in Eugene". He also noted down what are the main goals of the event- teach how to maintain one's bike and show the directions to the top-destinations of Eugene on a bike. Since the goal of the event to show bike routes to different destinations in Eugene, he decides that this event is going to be a multi-session event. And so, for each destination, he is going to hold a different session.

He also decides the target participant group for whom this event would be ideal. Since this event is for anybody new to the city, he decides to keep this event open for anyone interested in exploring bike-safe routes in Eugene. Besides this, to encourage more participation to the event, he thinks there should not be any fee required for the UO (University of Oregon) bike program members. But non-students need to purchase the yearly membership for $25 or need to pay $15 for a day-use permit and a one-time UO Community Member Card.

B) *Jack decides the date, time and venue:*

Jack figures out what dates, times and also locations would be better for this event. At first, he checks the schedule when he can be available for the event. He wants to conduct the event on working days so, it is hard to find out a free consecutive 2-3 hours slot for each session on working days and he also needs to make sure that there is enough daylight at that time. He checks the weather forecast to make sure nothing serious is in the forecast. Finally, he also makes sure that the classroom in Bike Program Office is available at those times before fixing the session schedules.

C) Jack figures out the maximum capacity of the event:

Since this event requires a classroom for the lecture, Jack decides to keep the maximum participant number only twenty, because the classroom in the bike program can occupy only twenty people at a time. He also keeps in his mind that, for a ride, it is hard to manage more than twenty people on bikes at the same time on the streets. So, he wants to keep the class small. The other issue he considers is that, since there is a bike maintenance session in the event, they have a limited supply of tools.

D) Jack gathers all resources that he needs for the event:

Jack arranges all the human expertise, bikes and accessories required for the event. Firstly, he lists up all the things he needs for the event. He needs at most twenty bikes because in the worst case this might happen that no participant brings his/her bike in the event. He also needs to have twenty sets of the toolbox to provide the participants during the bike maintenance lesson. Then he checks the inventory of the bike program, if there are not enough resources, he orders online to make sure that people can participate in the event without any worries of having their own bike or tools. He, then, decides what specific human expertise will be needed to conduct the classes and rides. Since this program is a very introductory kind, he decides to teach in the classes himself. He also looks for a person who can help in organizing this event, and he finds his colleague Henri who is equally excited about the bike programs and can also be available during the events.

Jack figures out which destinations to cover for the event rides. Jack has been living here in Eugene for the last four years and his primary media of traveling is a bike. So, he finds him well acquainted with the bike routes in Eugene. However, that experience is not enough for the event. Because he needs to find out 4/5 popular destinations of Eugene and also needs to figure out the shortest and bike-safe route to reach those destinations. He and Henri decide to pick four routes for this event: Downtown Eugene, Riverpath to Downtown Springfield, South Eugene Neighborhood Greenway, and the fourth ride is Riverpath, The Whitaker, and the Fern Ridge. They planned and scheduled the destinations such that the distance gets longer gradually. The first ride to Downtown Eugene is the shortest, and the fourth ride to Fern Ridge is the longest one. They wanted the participants to increase their biking stamina gradually.

E) Jack and Henri prepares for the event:

Jack and Henri take initiative to promote their event and prepares the sign-up process. There are several ways the UO bike program advertises about their events. They wanted to advertise every way they can get. They sent email-newsletters to all UO students and employees. They also posted the event on UO event website, opened an event page on Facebook and distributed event flyers. For the registration, usually, they put an online registration system in the UO Event website. But for this specific event, they decided to keep the registration process manual. So, to sign up for the event, people need to come to

the UO Bike Program office in person and then the front-desk people sign him/her up for the event.

Jack and Henri prepare lecture materials for the sessions. Jack prepares the lecture slides for the sessions and also consults with Henri to discuss what to include in the lecture slides. They essentially add some power-point slides on bike safety because they always provide a speech on bike safety in every event they conduct. As this event also includes a bike maintenance session, they also write down some mechanical issues that people with bikes often deal with. The main purpose of this repair session is to show people how to keep their bicycles rideable. They, finally, prepare the no-Liability forms for each participant. University authority requires them to get a signature from each participant so that if any accident or anything unexpected happens on street university authority will not be responsible for that.

F) Jack and Henri conducts the event:

Jack and Henri execute the bike event on the prescheduled date and time. They welcome the participants and greet them. Then they check their registration status. If anyone is found who has not registered, they help him to sign-up on the spot. Thus, people can just walk-in to the sessions to participate. Before starting the class, they request each participant to sign on the no-liabilities form. They also explain why signing on this form is necessary for the university authority. The next thing they do is that they check if anybody needs a bike or helmet and if so, they provide them for free for the session only. Jack provides a lecture on bike lanes on streets and bike safety rules, etc. He also along with Henri conduct a brief bike-repair session. And finally, they get ready for the ride to the preselected destination. But before starting their trip, they make sure that everybody puts on their helmet and if rain is forecast they also emphasize on wearing a rain jacket.

Hierarchical Task Analysis (HTA): Given in page 4.

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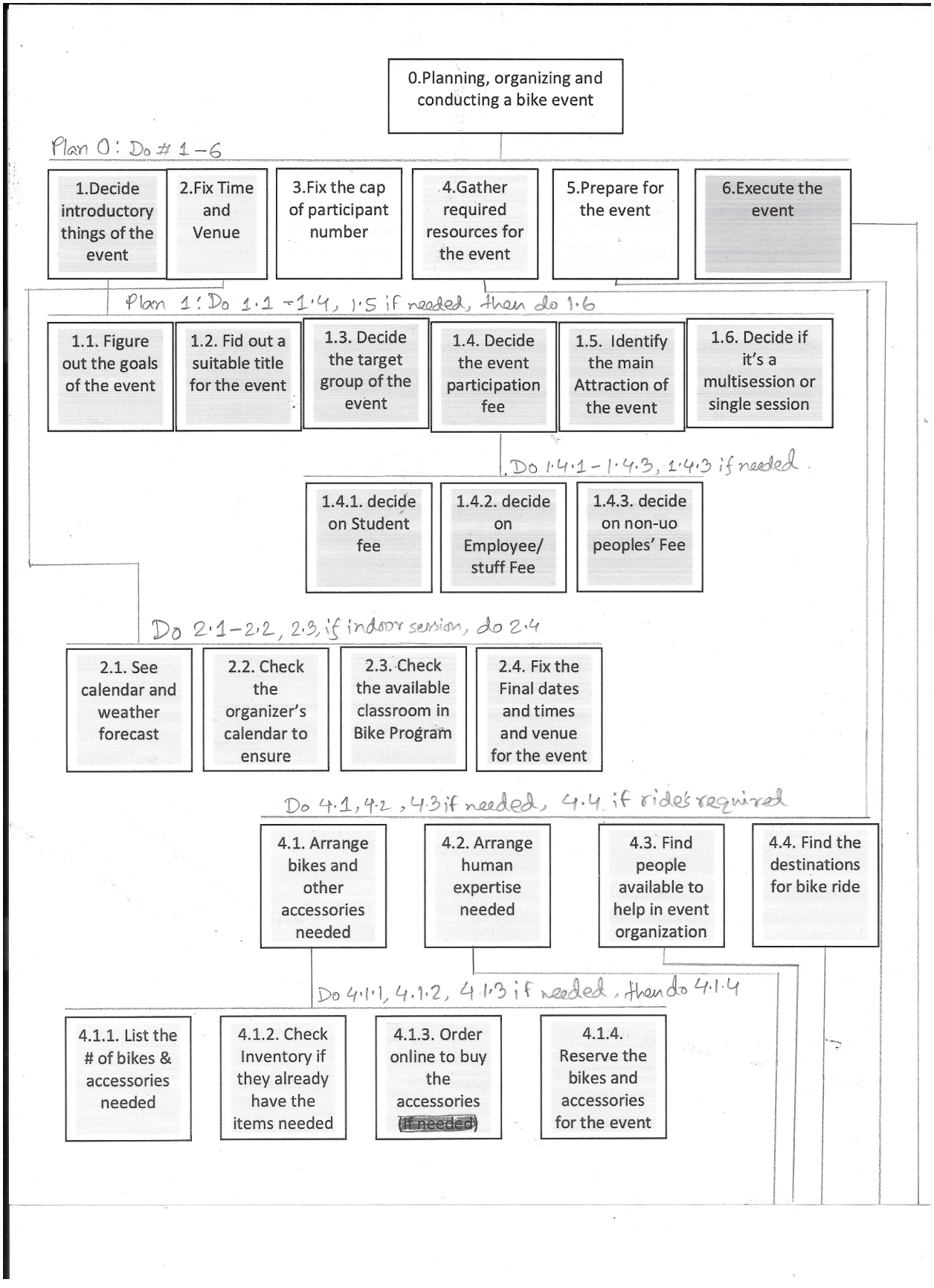

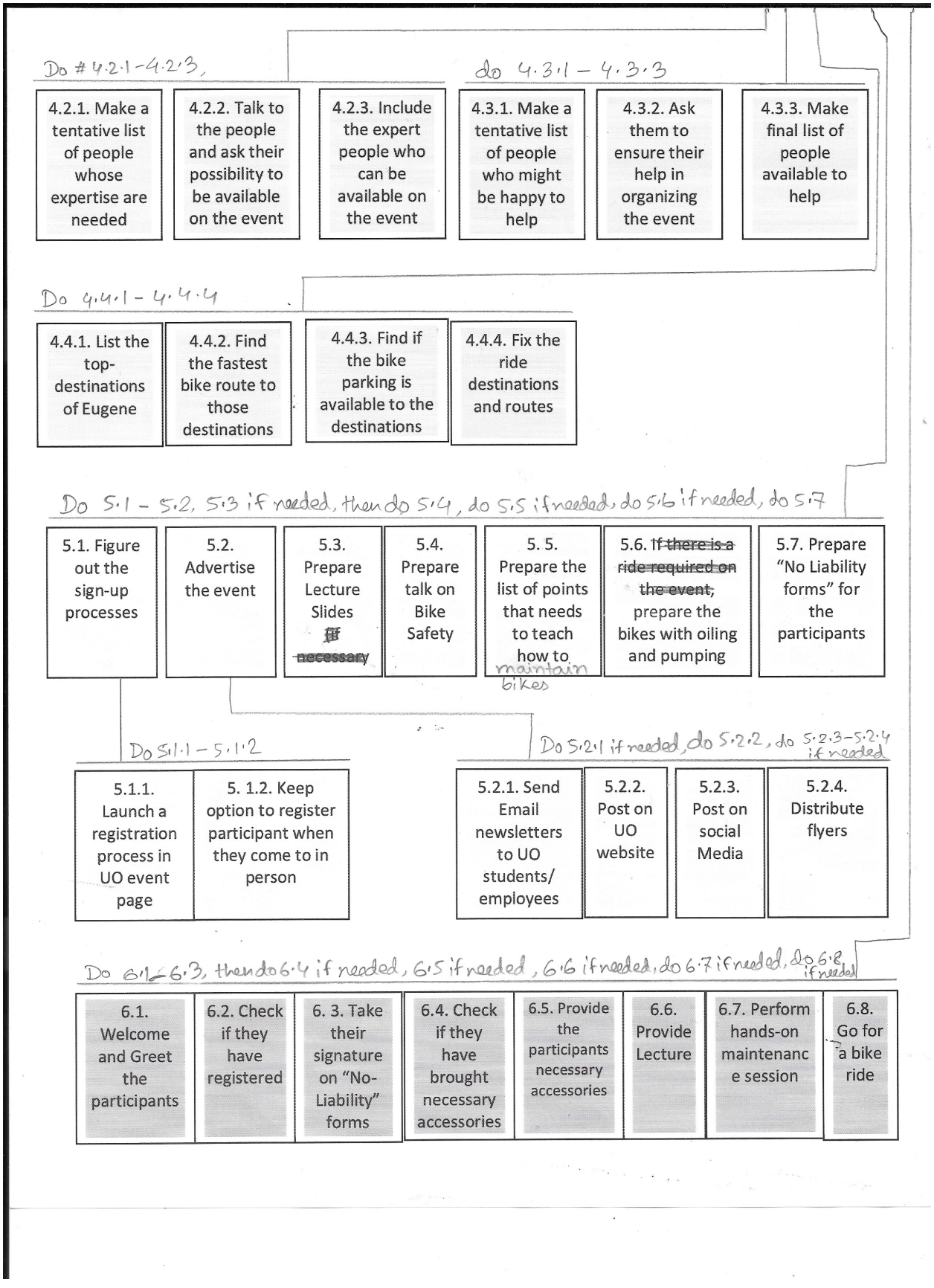
Do #4.2.1-4.2.3,
4.2.1. Make a tentative list of people whose expertise are needed
4.2.2. Talk to the people and ask their possibility to be available on the event
4.2.3. Include the expert people who can be available on the event
do 4.3.1 – 4.3.3
4.3.1. Make a tentative list of people who might be happy to help
4.3.2. Ask them to ensure their help in organizing the event
4.3.3. Make final list of people available to help
Do 4.4.1 - 4.4.4
4.4.1. List the top-destinations of Eugene
4.4.2. Find the fastest bike route to those destinations
4.4.3. Find if the bike parking is available to the destinations
4.4.4. Fix the ride destinations and routes
Do 5.1 - 5.2, 5.3 if needed, then do 5.4, do 5.5 if needed, do 5.6 if needed, do 5.7
5.1. Figure out the sign-up processes
5.2. Advertise the event
5.3. Prepare Lecture Slides ~~if necessary~~
5.4. Prepare talk on Bike Safety
5. 5. Prepare the list of points that needs to teach how to maintain bikes
5.6. ~~If there is a ride required on the event,~~ prepare the bikes with oiling and pumping
5.7. Prepare "No Liability forms" for the participants
Do 5.1.1 – 5.1.2
5.1.1. Launch a registration process in UO event page
5. 1.2. Keep option to register participant when they come to in person
Do 5.2.1 if needed, do 5.2.2, do 5.2.3-5.2.4 if needed
5.2.1. Send Email newsletters to UO students/ employees
5.2.2. Post on UO website
5.2.3. Post on social Media
5.2.4. Distribute flyers
Do 6.1-6.3, then do 6.4 if needed, 6.5 if needed, 6.6 if needed, do 6.7 if needed, do 6.8 if needed
6.1. Welcome and Greet the participants
6.2. Check if they have registered
6. 3. Take their signature on "No-Liability" forms
6.4. Check if they have brought necessary accessories
6.5. Provide the participants necessary accessories
6.6. Provide Lecture
6.7. Perform hands-on maintenance session
6.8. Go for a bike ride

Goal, Operators, Method & Selection Rules (GOMS):

To perform the subtask "4. Gather required resources for the event", there are four subtasks were required. The GOMS Method for each subtask are given below.

Method for goal: Arrange bikes and Other Accessories needed.
Step 1. List how many bikes needed for the event.
Step 2. List which tools needed for the bike repair class.
Step 3. List how many tool boxes needed.
Step 4. Check the inventory if they have necessary number of the bikes.
Step 5. Check the inventory if they have necessary number of the bikes.
Step 6. Order online for the bikes if step 4 returns false.
Step 7. Order online for the tools if step 5 returns false.
Step 8. Receive the orders.
Step 9. Reserve the bikes and tools for the event.
Step 10. Return with goal accomplished.

Method for goal: Arrange the human expertise needed.
Step 1. Check what expertise is required to conduct the event.
Step 2. Make a list of people who have the required expertise.
Step 3. Ask each of them if they can be available on the event date and time.
Step 4. Include the people in the list of expert people who can help in conducting the event.
Step 5. Ask them to reserve their calendar for the event.
Step 6. Return with goal accomplished.

Method for goal: Find people available to help in event organization.
Step 1. Check what helps are required to organize the event.
Step 2. Make a list of people who might be willing to help.
Step 3. Ask each of them if they can be available to help in organizing.
Step 4. Include the people in the list of people who can help in organizing and preparing for the event.
Step 5. Return with goal accomplished.

Method for goal: Find the destinations for bike ride.
Step 1. List 4/5 top destinations in Eugene.
Step 2. Find the shortest bike route to reach those destinations.
Step 3. Check if the bike parking is available in those destinations.
Step 4. Include the destinations in the final list if step 3 returns true.
Step 5. Return with goal accomplished.

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Reflection:

Upon completing the project, I have learned how a task can become more complex in terms of user-centered requirements analysis. The task in this project is to analyze how the UO bike program people organize an event. This task is already seemingly complex. And analyzing the task and breaking it down into a well-structured hierarchal task analysis is undoubtedly more complex. The first and foremost challenge was for me to conduct a useful and informative interview when I didn't have any idea how to ask the right questions so that I can get as much information as possible. But as I started asking the questions, the interviewees gave me more information than I ask for and the whole conversation became more engaging and went like a flow of sequential conversation. And I finally felt like I have got a clear idea of how they have performed the whole task. Yet, the task analysis was much more complex than I expected, especially when a subtask gets divided into so many other subtasks and so, in this project, I tried to keep the task analysis as concise as possible to make it comprehendible.

Through this project, I also analyzed the task that I could not observe them performing. Since they have been planning this event since the summer term, I could not observe how they planned and organize the whole event. But through the interview, I walked through the whole process with their story about how did they start planning and organizing the event. I think, my question set helped them to go over every task and subtask again. But from just questions and answers, it was hard to analyze the tasks hierarchically - to sort the task in a routine procedure including some subtasks that depend on certain condition and some tasks were pursued in parallel when Jack has got Henri to co-lead the event organization.

I got the opportunity to observe them performing the most important subtask - how they conduct the actual event. Observing them how they execute the whole event from greeting the participants to going for the ride, helped me to analyze that sub-part with more confidence and so, I have found this part easy enough to summarize the general steps they took to conduct the event - welcoming participants, greeting them, checking if they have signed up or not, taking their signatures on the no-liability forms, giving them required accessories, providing lecture on bike-safety, showing them some bike repair strategies, and finally getting ready for the bike ride.

This project helped me learning the requirements analysis to design a user interface. Through conducting interviews and observing them perform the task helped me to walk through the whole process and thus I could sort the tasks and subtasks in order and also divide some broad tasks into subtasks. I think this task analysis is a key requirement to design an easy-to-learn and easy-to-use user interface. Since the task analysis is the first phase in the software development life cycle, through this step the usability of software development can be ensured to a large extent.

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Observations:

I interviewed Jack and Henri who are student employees at the UO Bike Program office. It seemed to me that they were pretty welcoming and showed the same level of interest in the whole process of question-answering. As soon as I arrived there for the interview, they immediately postponed all their work and came to introduce themselves. Their attitude towards the interview process was excellent and they showed a lot of interest in why I am interviewing them and what will be the outcome of that. They were so thrilled with the whole interview matter that they requested me to show them my final project report if I can. Especially when I explained to them that I am going to draw a hierarchical task analysis (HTA) on their event, they got amazed and told me that if I can show them the HTA, it might help them understand their task in a more organized manner.

I could observe them performing the last and the major subtask of the hierarchical task analysis. The first participant came and they both stood up to welcome him and shook hands and then introduced him with me. Then they also told him about me that I was there to know about their event. As this was the fourth session of the event, the organizers already know him and didn't need to check if he is signed-up or not. But they took his signature on the no-liability form. And after that, they also didn't talk much on bike-safety or bike-repair because they already covered those in the first two sessions. Since it was the last session, they had the longest ride on that day. So, they asked the participants if they have brought their bikes and helmets. And then they started getting ready by putting on the helmet and refilling their water bottles. And then finally they went for the ride to the Fern ridge.

Questions:

1. Are you a student employee or staff/employee?
2. For how long you have been working here?
3. For how long you have been organizing bike events?
4. Is this the first time that you are having an event on intro to biking in Eugene?
5. What motivated you to initiate this event?
6. Who can participate your events? Students/employees/others?
7. What is your main target group for this event?
8. What exactly the main purpose of this event?
9. Does this event demands any minimal required artifacts that participants must bring?
10. Does this event demands any minimal expertise that participants must have?
11. When you first came up with the idea, what are the things that you did to start the whole event organization?
12. How do you advertise the event?
13. Is there any sign-up process required?
14. How you decide for the participant fee?
15. How did you select the time and venue for the event?
16. How you decide on what manpower you need for the event to assist or conduct the event?
17. How did you decide where should be the destination for the rides?
18. For the events, how you decide what to do in the event? Teach, lecture, hands-on workshop or go for a ride?

19. What do you do if any accident/bad incidence happens?
20. Are you going to organize this event in future?

Notes on Jack's answers:

- Student employee
- Its been one year+
- have been organizing bike events every term.
- This is the first time we are offering this intro biking in Eugene to introduce bike route to travel by bike in Eugene
- I think its the fastest way to travel in Eugene, because there are shorter bike routes to go from one point to others
- To make new students know how to go different popular destinations easily by bike. Often, they don't know the bike routes, new students have to struggle to find out the routes.
- anybody can join. Its free.
- Main target group is the new students.
- Bike and bike accessories are not required. Just bring water-bottle, rain jackets
- If you can ride a bike, that's enough to participate.
- Ever since we had the event idea, we started thinking if it should be a single or multi-session event, what a good time-date, how to advertise, how many participant to allow, who can help me for the event- I found Henri, finding the destinations for the ride and the bike routes, and prepare what to-do on the events
- We advertised through UO news-letters and uo event website, through social media, etc
- They had to come in person to register. people show up on the event with no prior registration, we make them register on the spot.
- just membership is required, if uo student, then they are already member.
- Ofcourse checked our availability, and then weather forecast and also wanted to make sure if there is enough daylight for the ride
- Since we both have been teaching/executing events, we ourselves actually organize and teach in the class
- Generally to go from one side to another of Eugene, people have to bike 6-7 miles. Initially it may sound scary, but with practice its not that bad. People have a perception that you will get sweaty f you bike. But if you go in moderate speed, and bike calmly, you will not sweat, its not hard work. My intention is to change this perception.
- My focus is to highlight the biggest geographical distance. i wanted to divide this event in four sessions. Each of the sessions show participants different sides of the city, riverpath, the route to springfield, the route downtown, and the south path-alderstreet to go down to south eugene. These are the specific infrastructure that has been designed for the people with bycicles. If you don't know that those routes exists. You can use google maps, but google map can take you to wrong way.
- We talk about bike safety, bike rules. This event was about to show bike maintenance and ride. So, we planned what to show to do top-level maintence, to maintain your bike ridable. sometimes we also take decision what to teach on-the-fly during event and ask participants what they are interested on. Then we talk about on that.

- We are planning to offer same kind of event next term but with different title, because intro to bike didn't attract that many participants this time.

Notes on Henri's Answers:

- Student employee
- one year
- me and Jack have been organizing bike events together since 4 terms.
- It's the first time
- Bike is the most healthy, eco-friendly way to travel.
- just wanted to be a guide to new people who don't know much about the shortcut ways of bike
- Its free for all members, employees need to pay $20, and also the community people can join us too
- Main target group is whoever is new to Eugene. Doesn't know the shortest bike route to top-destination of Eugene.
- Just bring nice attitude.
- Nothing.
- Jack had the initial idea and I am basically co leading the event with him
- advertised with UO emails, news-letters, distribute pamphlets, uo event page, create an event on social media, etc
- Two ways either register through uo event registration or come in person to the bike program office.
- No fee required
- weather forecast and daylight
- Jack usually teaches
- Our biggest part of organizing this event was: what are the top destinations that people might want to see and to show how to get there
- mostly bike safety, bike routes and go for a ride.
- We have a "no-liability" form and university authority pushes us to take signatures on that from each participants. UO authority wont be liable for any accident or incident happens to participant.
- definitely, but with other title, I think may be people don't like the idea of "intro" or it's a bad time of the year for bike program.