

OHPH10 - Behavioral Research Methods 2

# Assignment 2

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# 1.Introduction

Technology was introduced to reduce human efforts and to make work more efficient. Ever since the advent of technology, it is embedded in ticket machines when we travel and also in coffee machines for keeping us awake when we work. This technology is actually supposed to make life hassle free, but sometimes it takes a lot of mental effort to figure out how to use these simple machines.

For this report, we picked one such machine we interact with often, especially during breaks in between lectures: a coffee dispenser. Coffee machines are found in every building at Tu/e campus. The coffee dispenser in the cafeteria of the Paviljoen building on the Tu/e campus is what we chose to work with because we noticed that it takes more time to get coffee in the cafeteria than at other vending machines in the buildings.

One can find a long queue of people waiting to avail coffee at the cafeteria during the breaks between lectures. When we notice how every individual uses the coffee machine we can identify the problems that they encounter while using the coffee machine. Things go wrong when people interact with the coffee machine, which makes a very simple and quick process to be time taking and complex. In order to study more about why this process is time taking, we decided to study the following research question:

*“Why does it take a lot of time to buy coffee using the coffee machine at the cafeteria in the Paviljeon building at the Tu/e campus?”*

Things may go wrong right from picking up the right sized cup, selecting the coffee, not knowing about the responsiveness of the touch screen. Another thing that can be time taking is when the person has to pay for the coffee manually to the cashier in the counter, as a result people end up waiting in a queue twice. Also, during the breaks there are a lot of students who come to get coffee and the entire process seems delayed.

In order to find out the underlying reasons for the delay in the entire process, with an unbiased mind we perform observations that would help us understand why it takes time to buy a coffee using the coffee machine at the cafeteria. The rest of the report contains details about our observations on identifying where things can go wrong and what are the things that can go wrong while people use this coffee machine, themes we derived from the observations.

## 2.Method

### Design

In this observation, we will perform a direct observation with unstructured interview for collecting the data. This method is chosen to get to know and explore more about the real experience of people's behavior using the coffee machine. Specifically, we will perform instantaneous spot sampling to observe people use the coffee machine in the Paviljoen's canteen and focus on how they interacting with the coffee machine. This will be done by taking repeated short samples under the most natural settings.

We will observe people's behavior when they use the coffee machine in the Paviljoen's canteen during the break-time for three days. We will take a position where we can observe people in a distance but clearly to see participants' behavior. All the observers will do a number of observations and we will write down field notes while we are watching for each participant.

### Participants

The sample involves people who are most easy to reach, this means we will use non-probability sampling to observe people who use the coffee machine. The participants are people who use the coffee machine in Paviljoen's canteen during the break-time.

### Procedure

All the observers will meet at Paviljoen's canteen 15 minutes before the break-time. We will unobtrusively sit in the place where we can observe people in a distance but can clearly see the participants' interaction using the coffee machine. When there are people come to buy a coffee using the coffee machine, we will write down jottings while we are watching them.

After observations, we will combine all of field notes for each observations.

### Analysis

The data that we collect is a qualitative data from field notes taken while watching the people using the coffee machine in their natural way. For analysis, we will perform a qualitative analysis on qualitative data. All the field notes will be combined and marked for the things that we think important. After reading through all the highlighted things, we will identify interesting relationship among them and grouped them into different categories. These categories will be used to create a schematic map to report the patterns from the data into themes. When we identify the themes, we will analyze them using these questions "*What happened?*", "*How did it happen?*", "*Why did it happen?*", "*What was the result?*".

## 3.Results

Based on our observations, all the field notes from each observers were gathered. Then, we highlighted the occurrences of events we thought were important. After we highlighted the important findings, we discovered interesting relationships and grouped them into four main themes. We created a schematic map of the thematic analysis to identify, analyze and report the patterns within our findings (see Figure 1). We also identified two types of-people who buy coffee, namely: people who came with no companion (alone) and people with companion(s) (friends).

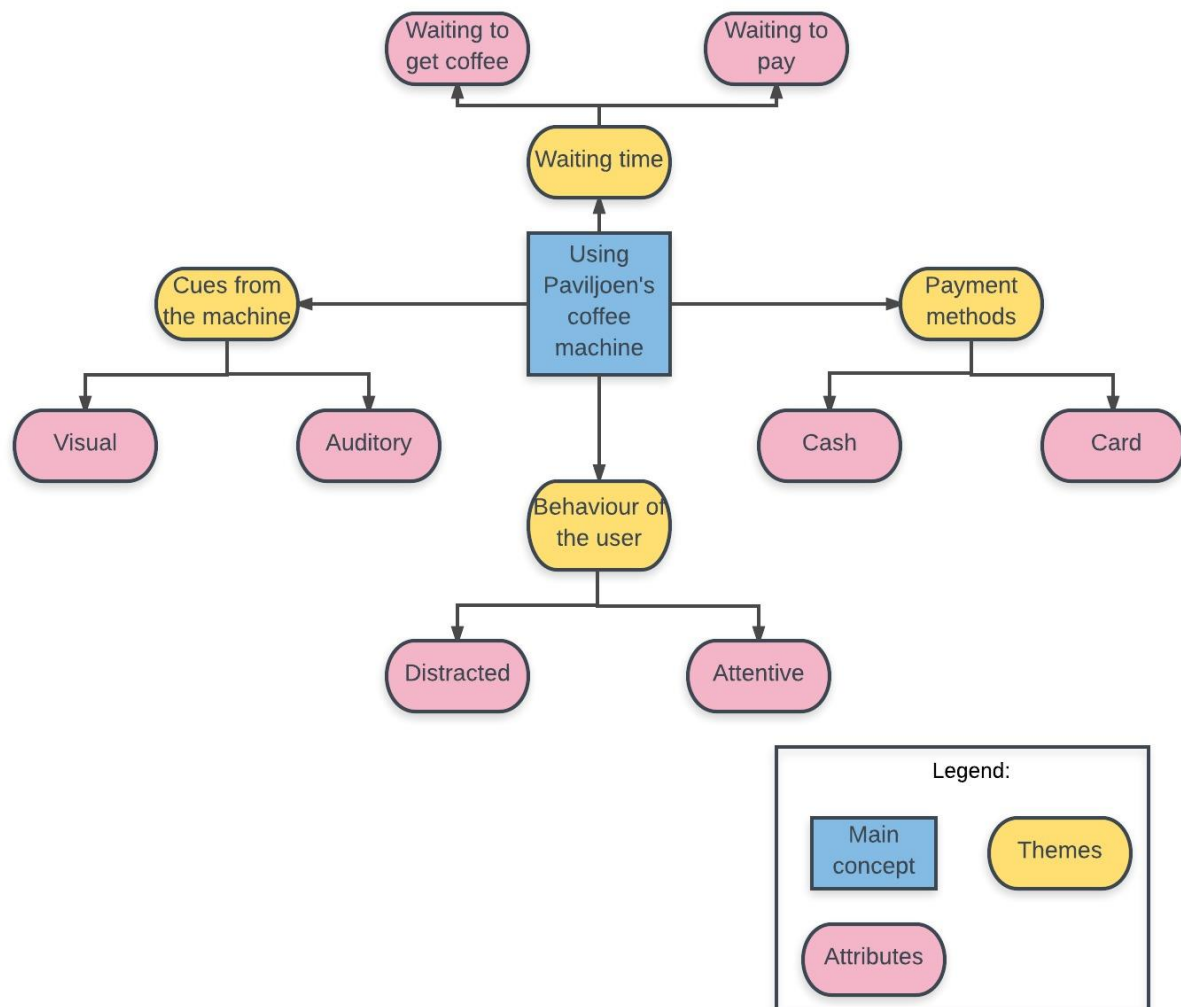


Figure 1. Thematic map of data from field notes

## Behaviour

When people buy coffee using the coffee machine, they came either on their own or with their friend. This factor can lead to the users' behaviour during the buying process, especially while they were waiting for the cup to be filled. Both type of buyers can be

distracted or attentive. For example, people who came alone were using their telephone and look around. *"13:45 A guy looks around, looks at other people", "14:04 While he's waiting for his cup to be filled, he grabs his phone and talking on the phone"*. People who came with friends were talking with their friends during the waiting process. *"09:29 A girl puts the cup on the coffee machine and talking with her friends.", "09:30 A guy put the cup on the coffee machine and talking with the girl before and their friends."* Both of the group people were distracted while they were waiting for the coffee to be filled.

Both type of people also showed attentive behavior. They were paying attention and keep looking at the cup while their cup was being filled with the coffee. *"13:37 While he's waiting for his coffee, suddenly he holds the cup and looking at the cup", "13:53 A girl keeps looking at the dispenser", "14:10 keeps looking at the cup- looks and waits even after it was full"*.

## Cues

When people perform any task they look for cues as a confirmation if they're performing the right task or as a confirmation that the task is completed. Cues can be both visual and auditory, they serve as a confirmation to the users. Based on our observations, we noticed that the coffee machine lacked cues, both visual and auditory. The users were unaware of when to take out their cup after the coffee was filled. They were still waiting and being hesitant to remove the cup after even after the cup was full. This was observed in the following cases *" he kept looking at the cup for some visual cue even after the cup was filled" "looks at the cup to make sure the cup was filled and finished" "after it is filled waits for a few seconds to pick it up"*. From these quotes it is pretty clear that there was a lack of cues from the machine that didn't provide a confirmation to the users that they were looking for. If there were cues then the users would have known about when to remove the cup.

## Payment Methods

The coffee machine in the Paviljoen's cafeteria come without the payment options like other coffee machine available in the university. This means that when people who buy a coffee using this coffee machine, instead of they pay it directly at the coffee machine, they have to pay in different place (at to the cashier). *"13:37 And then he took the cup and pay at the cashier", "13:40 A girl collects the cup and goes to cashier to pay and leaves", "14:10 after 2 or 3 seconds takes it out and goes to cashier"*. Two people did not know how to pay for the coffee and they looked around being confounded/ confused. *"13:36 Two guys could not find the cashier, then looked around to pay their coffee"*. A guy intended to pay at the coffee machine. *"13:50 A guy takes money from pocket and starts counting it"*. The payment can be done with cash or card to make all of the people profit.

## Waiting time

Waiting time is another important theme that we discovered during the observations. This can be divided into two: 1. Waiting time for getting coffee, 2. Waiting time to pay for the coffee. Most of our observations were made during the break times in between lectures when there were many students who came to pick up coffee. When we made observations during the lunch break not many people bought coffee but these people had to wait in the same queue with people who bought lunch. During shorter breaks people came to the cafeteria to buy

just coffee, we noticed that the waiting time to get coffee was higher because there were a lot of other students in the queue to get coffee, *“14:33: many people in the queue waiting”* and almost all of them got coffee. Because it is a cafeteria the students have to pay for the coffee to the cashier and they had to wait in another queue to pay. During the lunch breaks there were very few people who bought coffee but still had to wait in the queue to pay with the people who bought lunch. Sometimes the cashier would not be present at the desk *“waits for cashier” “waited for sometime for the cashier and keeps looking around lost”*, these quotes from the field notes make it clear that people spend time waiting for the cashier to arrive at the desk.

## 4. Discussion

With regard to the study as a whole, we feel that we were successful in achieving the task set out, that is, to answer *“Why does it take time to buy coffee using the pavilion’s coffee machine?”*. With introduction section of the report summarizing the technology we chose to evaluate, method section briefly described the design, sampled participants and procedures of the method we chose. Result section succinctly covers not only the themes but also the derivation of themes from collected field notes.

One of the key aspect of our investigation was the usage of observatory study for gathering data. Before conducting the study, we practised taking field notes and discussed about sampling method. Since the study was to be done at Paviljoen canteen, we decided to go with the participants who came to buy only coffee and not the ones who bought coffee or tea with other items available in the cafeteria. This helped us to comprehend the reason for the added time taken to buy coffee by avoiding confounds.

From the analysis of data, four key themes were obtained. The four themes are behaviour, cues, payment methods and waiting time. Of the four themes, the one theme that occurred the most, almost in all the observations was the “cues” or the delay created due to the lack of any auditory or visual cues. From the manifestation of the theme “cues” in the observations, it can be inferred that, there is strong association between “cues” and delay in the process of buying coffee.

This finding led us to the following hypothesis,

*H1: The lack of cues - both visual and auditory, can cause a delay in the entire process of buying coffee.*

Although, lack of cues can cause a delay, in some cases this was also enhanced by the ineffective payment method adopted at the canteen. Participants after getting their coffee or tea, had to stand in another queue at the payment desk where many a time the cashier was absent or was too crowded during peak times. Further, we observed that participants, when they were alone, got lost in their thoughts or phone and got engaged in conversation with their friends when they came with a group. This also created delay in the process.

# Appendix

## A. Field Notes

### 9 January 2017

13:25

Looked young- maybe bachelor's- picked up cup- placed the cup on the collector- choose his coffee- took back the cup when the process was over.

13:36

Two guys- knew what to get- picked up cups- placed cup- pressed button- waited for sometime- no cashier- looks around - pays- leaves

13:37

One guy-picked up the cup and placed it on the collector- pressed the button- kept looking at the dispenser for visual cues- took the cup and left after paying

13:37

A guy is putting a cup under the coffee machine then press the button. While he's waiting for his coffee, suddenly he holds the cup and looking at the cup. He seems to make sure if the cup is filled and finished. And then he took the cup and pay at the cashier.

13:40

Girl- picks a big cup- selects tea- leaves the cup on collector- goes to the side- picks up dip- sees its full- collects cup-goes to cashier- pays and leaves.

13:45

Guy- takes two cups- puts one on the dispenser- presses button- looks around- yawns- looks at other people- sees if cup is full- then places other cup- presses the button- keeps looking at the cup if it is full- after its filled waits for a few seconds then picks it up- leaves to pay.

13:50

Guy- picks up a cup and place it on the collector-looks around-keeps looking around-takes money from pocket and starts counting it- looks at the dispenser- take the cup and leaves.

13:50

A guy put a cup under the coffee machine, then press the button. While he waits for the cup to be filled, he looks around. He holds the cup and look at it to make sure it's filled, and took the ready-coffee-cup. Then, suddenly, he put another cup (second cup), press the button, and wait the cup to be filled. He puts his hand on the cup again and waiting for the cup to be filled. He keeps looking at the cup to be finished.

13:53

Girl- picks up the bigger cup- then chooses smaller one- places the cup and push the button- keeps looking at the dispenser- takes the cup back when its full- pays the money and leave.

14:00

Guy- picks three cups- knows dispenser can fill two cups at a time(water and coffee only)- keeps two cups presses button- talks over phone keeps looking at cups- didn't know it was done filling- takes cup out- places other cup- repeat- goes to pay and leaves.

14.04

A guy took a cup of coffee and waiting for his cup to be filled. While he's waiting for his cup to be filled, he grabs his phone and talking on the phone. He didn't know the coffee is ready and kept talking on the phone. Then he grabs the filled-cup and placed the new cup. He's waiting for the cup to be filled and look around.

14 :10

Guy- takes out one cup- puts it on tray- presses button- keeps looking at the cup- looks and waits even after it was full- after  $\frac{2}{3}$  seconds takes it out and goes to cashier.

## 10 January 2017

09.29

A girl put the cup on the coffee machine and talking with her friends. She put her hands on the cup and waiting for the coffee to be filled. When the cup is already full, she kept her hand on the cup and still busy talking with her friends. Then she noticed that the cup is already full and took the cup.

09.30

A guy put the cup on the coffee machine and talking with the girl before and their friends. While waiting for the cup to be filled, he kept talking and didn't realize that the cup is ready to go. After he noticed it, he took the cup and go.

09.31

Two guys (A and B) put the cup to the coffee machine. Guy A is talking with his friend and the guy B is holding the cup and waiting for the cup to be filled. Guy A keeps talking with his friend and the guy B keep looking at his cup to be finished. When it finished, the guy B took the cup right away and the guy A took it after few seconds he noticed.

## 11 January 2017

guy- very very confused- picks up cup- chooses another cup- doesn't know it's full-time searches for cashier- pays.

pguy- picks up cup- keeps looking at cup- doesn't know it's full- pours something from flask- - pays.



14:30 many people- in queue

girl

makes tea

guy presses button and keeps talking to people around

he's not looking at the cup

realises it's full

next guy goes

lady fills beans

guy makes coffee

another guy

presses button keeps talking and doesn't notice the machine

doesn't realize it's full.

## **12 January 2017**

11.55

A girl put the coffee to the coffee machine and then press the button. While she's waiting for the cup to be filled, she's playing with her phone. Then she keeps look at the cup to be filled. After it's finished, she took the cup.