Cultural Probe Write-Up Report

PART 1. Abstract & Background

a) Problem Domain: Our problem domain focused on monitoring and tracking users' various consumption behaviors and expenditure patterns over a one-week period.

b) Goals: Our goal for this project was to utilize cultural probes to track monitor individual expenditure patterns as well as identify user needs, problems, breakdowns, and workarounds regarding personal financing. Ultimately, we wanted to assess, understand, and solve personal financing issues to optimize user budgeting and planning for future expenses using a real-time expenditure tracking app. This allows efficient allocation of personal financial assets and simultaneous money management, especially for college students who tend to be under a tight budget.

c) User Choice: To make our problem domain focused, we restricted our target population group to current college students at a public university (UW-Madison). We thought that a cultural probe was appropriate because we determined that the nature of our given task associated with the cultural probe (self-reporting of intermittent daily expenses over a one-week period) would give sufficient in-situ datapoints regarding daily expenses that occurred in intermittent intervals. We decided to use a cultural probe targeting college students because we identified that college students were in unpredictable environments especially during the COVID-19 pandemic, constantly on the move, and not comfortable with us observing them all the time. In this way, we attempted to focus our principle of representation to better identify and understand user needs within the personal finance domain.

d) User Demographics Analysis We conducted a cultural probe on three college students (participant A, B, and C from hereon to maintain anonymity and confidentiality) who are current attendees at UW-Madison. Participant A is a junior (23 years old), female, and a STEM major. Participant B is a senior (23 years old), male, and a computer science major. Participant C is a senior (24 years old), male, and a finance major

PART 2. Methodology

a) Goal Because we wanted to capture information in context of repeated and intermittent task exposure/experiences in the participants' natural setting, we gave each participant a cultural probe and a task associated with the given probe, namely requesting them to file a self-report of their weekly expenditures and consumption patterns over a one-week period using Google Forms. We integrated various higher-level focal points and categories as columns of our entry. This supports our goal of understanding user needs in our problem domain because data about participant buying patterns could be categorized on key higher-level categories.

b) Design: Initially, we intended to design our cultural probe by requesting users to file and report each purchase on notecards in a binder ring. However, we realized that this approach was inefficient and inconvenient because purchases are made in random locations and the users had to always carry the notecards with them. In addition, since the number of purchases a participant makes in a week occurred in intermittent intervals, it was difficult to assess how many notecards to give to each participant. We concluded that the best design for our cultural probe is an online form for each user. Every time the user makes a purchase, they submit a corresponding entry on the online form. Each user was given a unique form link, which enabled us to isolate each participant's purchases. Since the user was able to fill out the forms on their phone, this guaranteed both convenience and portability. Additionally, since each purchase is an additional submission that corresponded to an entry in our table, our cultural probe design eliminated redundancy while maintaining data integrity, reproducibility, and consistency. Finally, we decided to integrate quantitative and qualitative approaches by statistically analyzing self-reported

expenditure patterns and conducting an open-ended follow-up interview to collect snapshots of each user's thoughts, feelings, and motivations regarding each purchase.

c) Data Collection: Data was collected by requesting participants to file a self-report of their weekly expenditures and consumption patterns on Google Forms over a one-week period. Every entry on the submitted Google Forms corresponded with each purchase that each participant made throughout the week. Open-ended follow-up interview was conducted to assess how each purchasing decision was made and user experience regarding each purchase. We also color-coded each type of purchase in our raw data to visually categorize each type of purchasing item.

e) Conceptual Abstraction and Data Categorization: There were numerous data points that we extracted from our cultural probe. In terms of higher-level data focal points, we focused on the significance of purchase, timing of purchase, reasons and motivations behind the purchase, type of purchase, cost of item, and the item purchased. We categorized these higher-level focal points as columns that corresponded to specific purchases in our table entry.

e) Quality Control Procedures

Since our cultural probe is a self-report from the participants, our quality control procedures involved using a real-time, online, mobile phone-based submission form that corresponds to each purchase. This design ensured efficiency, convenience, and portability of the self-report. Prior to conducting the cultural probe, we provided each participant with a 15-minute debriefing session to clarify the goals, overview, procedures, context, and timeframe of our study. Each purchase was an entry in our table and were categorized based on columns that provided insight on higher-level focal points such as significance of purchase, reasons behind the purchase, cost of item, etc.

f) Follow-Up Interview

Follow-up interview questions were formulated to address points that could not be extracted from the self-report; they were conducted to gain a qualitative insight and understanding of each user's thoughts, feelings, and motivations regarding each purchase.

PART 3: Data Analysis & Findings

a) Modeling & Data Analysis

To model and organize the data we collected, we used an affinity diagram to cluster our data into hierarchies. Our focal question was how users budget their expenditures on a weekly basis. One recurrent theme that we extracted from our data is the higher-order grouping of purchase items (luxury, impulse, necessity, and miscellaneous goods) which had an impact on expenditure patterns. We then organized and categorized each note based on the type of purchase item. For luxury items, we discovered that cost/money, personal distraction, and social image were key factors. For miscellaneous items, we discovered that participants tended to make unavoidable purchases using quick decision-making. For impulse items, we discovered that participants tended to make spontaneous decisions. Furthermore, factors involved with impulse purchasing involved the timing of the purchase (time of the day and the week). For necessity items, we extracted that age and social status tended to significantly influence purchasing behavior and expenditure patterns. Since necessity items were usually essential items such as food, utilities, and groceries, we discovered that individual budget had the least influence out of all the other types of items. We also designed a cultural workflow model to understand the workflow, note breakdowns, and workarounds to identify design opportunities. The cultural workflow model provided insight about external influences, expectations, values, and culture of purchasing behavior. We identified some key cultural factors that influence buying behavior. For example, participants tended to be more cost-sensitive when the purchased item is a necessity item. However since necessity items are essential, participants differed in how they assessed the opportunity cost related with it depending on their demographic characteristics. We also discovered that participants tended to be susceptible to reckless, unplanned spending during weekends and after sunset especially for impulse items like alcohol.

b) Findings

After organizing, distilling, and modeling key information from the data that we have collected using affinity diagrams, work models, and graphical analysis, we have summarized our findings in the list below:

1. Participants tended to spend additional money on impulsive/social purchases which they categorized as low significance, which constrained their budget for necessity goods

2. Participants with more lenient weekly budgets tended to forget about their budget as the week went on. In other words, their spending habits were not affected by the budget due to the lack of focus on the current state of budget

3. Participants with a stricter budget tended to overcompensate on saving money after making a relatively expensive purchase on a non-necessary good

4. Participants struggled to manage their budget due to unclear planning on what they were going to spend money on that day, making it hard to keep track of the budgeting since most purchases were made without forethought.

5. Participants with less strict weekly budgets tended to overspend on non-essential goods which led to exceeding the initial weekly budget that they had set.

6. Participants' spending habits changed due to the Covid-19 pandemic. Since our demographic target population was college students, weekday/weekend spending patterns tended to blend due to lack of in-person classes. However, in general, participants' tended to spend more on low significance purchases during weekends.

7. No one was truly satisfied with how they budgeted their money for that week and believed that trying to track their budget by themselves manually led to poor money management.

c) Stories: The stories generated attempted to capture key higher-level concepts regarding a user's buying patterns throughout the time of the day and week. It captures categorical information on how personal assets were allocated as well as the implications, trends and patterns associated with buying behavior. Our stories also address key design opportunities, workarounds, and solutions to a particular user's context from the collected data.

Participant A:*"Participant A went way beyond her weekly budget, spending a grand total of $262.2 given her weekly budget of $150. Despite her tight weekly budget, she seemed to spend recklessly on miscellaneous items such as coffee, dining out, and alcohol. Being an avid fan of Starbucks and a Vanilla-Latte addict, she spent 20% of her total expenses to indulge in caffeine. Her spending was irregular and there was no distinctively identifiable trend besides her frequent indulgence in coffee. At the beginning of the week, she ate out more frequently but attempted to offset her reckless spending by cutting down on dining costs. A possible design approach for participant A would be a real-time expense tracker with alarm functionalities that could remind participant A an overview of her expenses vs current budget.*

Participant B: *"Participant B was more economic, spending a total of $149.8 over a weekly period given a budget of $200. He tended to leverage and balance his spending by limiting his spending on luxury items as evident in his decision to purchase clothes from the Thrift Store, which sells used clothing at an affordable price. Participant B also limited his expenses over the time window by going on grocery shopping regularly and frequently, only buying what he needs at that moment. This is evident in that he spends less than $20 on each grocery shopping. A possible design approach for participant B would be an app with money management functionalities that provides a single-view of his expenses organized based on expense categories. Since participant B is economic and was able to have a positive balance, an app with a savings option would be beneficial too."*

Participant C: *"Participant C surpassed his daily budget by about $90. He spent $387.33 given his weekly budget of $300. Participant C's spending was unplanned and reckless. 5 out of his 13 purchases were color-coded red, which were impulse purchases. Being a nicotine addict and a social butterfly, more than 30% of his expenses accounted for buying JUUL pods, alcohol, and personal shopping. Although he did not consume a lot of miscellaneous goods besides snacks at the Badger Market, he dined out frequently, almost on a daily basis. A great design approach for participant B might be a real-time alarm that monitors and tracks his consumption patterns and alerts him on his impulsive purchases.*

PART 4: SOLUTION & CONCLUSION

a) Opportunities for Design and Solution

Some design opportunities that we identified after distilling our data is that the mobile app interface needs to be real-time and cross-platform to guarantee portability, ease of access, and ubiquity. Another design opportunity is to enable an integrated single view so that the user can have an overview of their expenses as well as their current budget. With this design idea, we also determined that categorizing and color-coding expenses based on higher-level abstractions like significance of purchase, timing of purchase, reasons and motivations behind the purchase, type of purchase, cost of item, and the item purchased would provide users with a categorical visualization of their spending trends and budget. We also identified that privacy leaks regarding user's account details, fund usage, and other financial information could be vulnerable to security threats. We attempt to address this by providing a real-time authentication code for read-only access to personal financing details to eliminate security risks. Integrating all these design opportunities, we devised an application solution with the following functionalities: 1. A functionality to plan out the user's budget before that day given identified expense trends/patterns. 2. Daily budget recommendations based on previous spending calculated by taking a weighted average of each category. 3. A weekly progress report on user expenses to track and monitor their past spending history. 4. A money management plan that simultaneously evaluates current budget given user's spending history. 5. A real-time alarm that alerts users if spending for a certain category exceeds current budget level.

b) Reflection

The cultural probe was a very intriguing experience. The easy part of the cultural probe process was conducting the self-report and transcribing the follow-up interview because the participants inputted the data repeatedly. The hard part of the cultural probe process was designing our cultural probe and analyzing the data through affinity diagrams, graphical interpretation, and work models. This part was difficult because it required us to extract and evaluate the significance of various markers and indicators that were implicit and dispersed unevenly. However, it proved to be the most valuable because it gave us deep insight on participant expense patterns and purchasing behavior. The users did provide us with the data that we expected for the most part. However, we had to formulate effective questions during the follow-up interview to further extract qualitative data such as reasons/motivations behind purchase and other implications of buying behavior for a specific type of item at various times of the day and week. One surprising finding that we discovered was that participants tended to purchase more low significance items during weekends. One change in quality control measure that we implemented was redesigning our design approach. Initially, we intended to give participants a set of notecards to manually record their expenditures. However, we found out that this approach was inefficient and inconvenient for the participants because it required them to carry the notecards all the time. We resolved this issue by requesting participants to report on Google Forms, which guarantees both portability, ease of access, and convenience for the participants. Reflecting, we could have improved our cultural probe by integrating demographic analysis to gain insight on how demographic characteristics affected buying patterns.