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# Money Planet: Helps University Students Manage Their Finance with Stimulating Behavior Change

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**Abstract**

How can we help university students to manage their finance? In this study, we designed an application, 'Money planet' helping university student manage their own finance by convert user's balance into color coded map through the process from research to design. To reach the final design solution, four steps are required in the aspect of process. First, Research or User study for better understanding of how users are doing to manage their own finance and a relationship between emotion and expenditure. Second, Findings for what is the result from the research for defining design implications. Last, our final design solution for what is our design outcomes and how we imply the design requirements into final solution. We concluded with key findings and our design solution implying how design is reasonable for the requirements.

**Author Keywords**

Finance; Receipt Collecting; UI Design; Financial application; Nudge; Self-tracking; Human Centered Design Process;

**ACM Classification Keywords**

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous;

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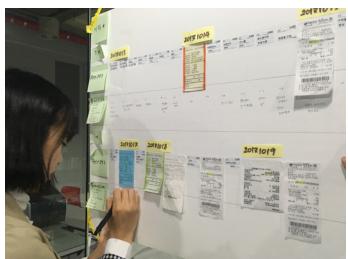


Figure 1: These images show, in order, the seven-day receipt attached to the board, the process of drawing emotional curves for each receipt, and the interview environment.

## Introduction

Students' financial knowledge has been turned out to be low through researches on college students' financial knowledge.[1][2][3] Financial stress is one of the key factor having negative influence on college students such as lower academic performance, reduced course loads, withdrawal from school and increased time to graduation[4], as well as poor physical and mental health.

According to report from college of education and human ecology, Ohio state university, college students had reported high financial self-efficacy, even though 7 out of 10 students reported feeling stressed about their finances in general. [5] and they had an experience of meeting with financial advisor or counselors, including a financial aid counselor(43.1%), peer financial counselor(13.8%) or financial services advisor(27.9%).

There exists professional help, but nothing exists for their lives with compensatory or understanding. Services for behavior change and financial issue for each like 'BeeMinder' for them but not combined service for it. Then how can we help university students manage their finance without stress?

## Research Process

### Survey

We conducted survey to see the various financial management of University student. The main questions were about income, the method of personal financial management and the aim of financial management. Open questions were set up for each main questions to get detailed answer. We created an interview questionnaire with google survey and shared links to facebook community and SNS messenger. 96 students were participated in the survey for three days.

### Financial History

To collect income and expenditure data of university student, all participants were asked to collect receipts for 7 days, the midterm exam period. The recruit announcement was posted on Facebook, and 27 applicants were gathered in 3 hours. Among them, 10 students (9 undergraduate, 1 graduate) were participated in *financial History*. 5 were financial management service users, the other were non-users. In case of impossible situation to collect the receipt such as using mobile services, they were asked to record on the Excel form provided. With receipts, we made *financial history board* to ask emotion related with income or each outcome that researchers cannot understand with only looking at raw data.

### Retrospective Interview

Interviews were conducted with the same participants of *financial history*, within 7 days of receipt collection. The questions were structured for finding latent thought about their past economic activities. Interviewees are asked to draw the emotion scale on *financial history board* that we made with collected receipt and excel chart. The range of emotion scales were from -3 (the worst) to +3 (the best).[7]

Interviewees are asked about income, the method of personal financial management and the aim of financial management. The service users were asked how they started to use that financial service and how they use that service in their daily life? We asked service non-users whether they have used financial services or not. In addition, service non-users are asked why they do not use financial services and how they manage their finance without any kind of services. For less overwhelming interviewing environment, interviewees and recorder are asked to sitting with facing each other, after that, the interviewer sit beside and toward interviewee. Interviews were recorded after prior



Figure 2: These images show personal inventory in the interviewee's wallet.

consent with participants, and key information was recorded in MS word by auxiliary interviewer.

### *Personal Inventory*

Interviewees are carefully required to provide their wallet and explain each component in the wallet. The method was to shape personal financial behavior via tangible possessions in their purses.[7]

## **Key Findings**

### *Manage money in abstract way*

Target users, in other words university students, generally do not manage their finance in specific way. They do not manage specific amount of money. All participants of service user group in *retrospective interview* do use financial service that tracks their consumption. They answered that they use financial behavior tracking application to check how much money they use in this month. Service non-user group mainly answer that they check their bank balance and controlled future consumption approximately.

"I usually manage my finance in my mind because I know how much money I spend in a month. I adjust my expenditure based on total spend." - P1, financial service user

"I just check money tracking application when I am just wondering how much I've spent in this month, because I can not check it all the time. I think it does not help much for saving" - P6, financial service user

"I plan my consumption by checking a bank balance" - P10, service non-user

### *Not regret impulsive expenditure caused by stress*

As a result of the emotion log of *financial history board*, university student does not regret their expenditure caused by stress. Particularly, during exam period, target users are more tolerant to their consumption.

They also do not want to be blamed their extra consumption such as taxi fee or snack purchase. Most of participants of survey and interview related their satisfaction of expenditure with the value of experience. When their experience of expenditure is positive, they give higher emotion scale, and if not, they give lower score.

"In the exam period, I was eaten a lot, because I was studying until late, and I also prefer to take a taxi to save time" - P5, financial service user

"Well, I usually do not spend much, but the impulse buying has increased since it was exam period. I do not regret it now. I had no choice but to do that" - P3, financial service user

"If I think I have enough money, I order expensive drink than usual at the cafe. It is for the happiness of small luxury." - P1, financial service user

### *Think wasted money when they spend for their needs*

Target user grudges money they spend on their necessity. They try to minimize the cost on their needs.

"When I buy something that I have to buy such as cell phone case, I find the cheapest one for 1 hour" - P5, financial service user

"I was reluctant to pay visa issuance. I felt like wasting money. I really hesitate to pay when I buy necessary thing" - P6, financial service user

"I lost my student ID card when I was studying in the library. I had to reissue it because I could not get into my dormitory without that. I was really reluctant to pay that" - P8, financial service user

### *Want to save money for traveling abroad*

Target users commonly show patterns that they would like to travel abroad after the end of semester. They think that they have no time to travel abroad after getting a job, so they have a strong desire to travel

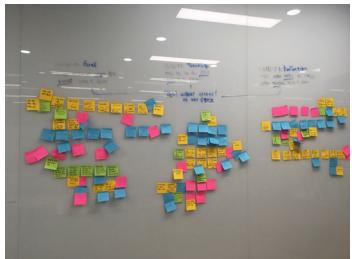


Figure 3: This image shows the brainstorming scene divided into three keywords: goal, tracking, and reflection.

abroad freely as a student status. As a result of survey, it was travel abroad that accounted for the largest portion of respondents' financial management goals. Moreover, all participants have travel plan after semester. However, there were few participants who have specific plan for saving money for traveling abroad.

"I want to travel abroad after this semester, I would gather money with part time job while taking seasonal classes. But I could not find to place to work yet." - P7, service non user

"I have plans for every vacation. I will go Mongol after this semester, take Siberian express for next vacation and travel Southeast Asia for graduation trip. May I save money until that time?" - P8, financial service user

#### *Not want to pay attention to money management*

Target user, university student does not want to get lots of stress on financial management because they are responsible for their studies.

"I want to concentrate on my studies. I do not want to take much time for financial management during student status. Worrying about my career is more important" - P10, service non-user

"Since student does not have a regular income, I just make proper amount of money to eat delicious food and travel abroad. If I think strictly manage my personal finance, I would get lot of stress" -P2, service non-user

### **Design Requirement**

- Not only amount of money, but context also should be tracked because satisfaction with consumption depends on mood and situation.
- Tasks burden should be minimized. University students do not want to put much attention to financial management.

- Feedback for point that target user may miss should be given because university student usually manage their finance in abstract way.
- For university students who have financial goals but does not have any specific plans, the service should stimulate target user appropriately to achieve their goals.

### **Design Process**

#### *Drive Key words*

With analyzing data gained above user studies, three key words are categorized.

Goal Oriented: Accommodate users to set their goal and stimulus user to achieve goals

Tracking: the new way of tracking financial activity, at some point between too automatic and too manual way

Reflection: Make users look back their financial activity and induce behavioral change without stress

#### *Ideation (Goal, Tracking, Reflection)*

We generated ideas through brainstorming based on the above three keywords. We draw sketch or explained concept on post it, share together and add comment for structuralized raw idea. Until valid ideas are generated, we iterated these steps. After combining and segmenting ideas, we got totally 22 ideas.

#### *Selection*

Among 22 ideas generated by ideation, we narrow down and selected one idea that fulfills design requirements most. That idea is selected from Goal category. It is the service that helps users set travel destination as a goal and nudges users to achieve financial achievement.

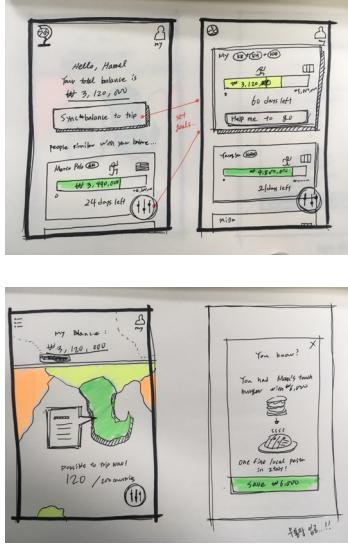


Figure 4: These images show the initial prototyping by hand sketching. Each screen is two versions of homepages, goal setting and social sharing.

### *Initial prototype*

Main concept is that bank balance is shown in a colored world map. There are three color steps and each step shows the possibility of achieving travel destination goal. Blue color means that 'it is possible to go', Yellow means 'you need to try more' and gray means 'you should save lot of money'. When a user set a travel destination, service shows estimated amount of money should be collected from now on. Colored map also abstractly show the status of bank balance for travel goal. Furthermore, we designed it possible to customize their preference about the essential factors of travel such as airplane, food and house. As a social function, we added share button to stimulate each other who have similar goals and to be stimulated by observing others.

### *Evaluation*

After prototyping with invision, we conducted think aloud method for evaluation the initial prototype. There were four main function, check account, changing world colored map mode, travel destination setting and finding travel history. 6 graduate students who take same class did heuristic evaluation and did severity rating for each function. Then we figured out the things need revising.

- They hesitate their bank balance with others. It would make users depressed.
- At a world map, red seems like dangerous place. It needs to be place where need lots of money to travel.
- Because there are two version of home, card and world map, it is hard to find where to start for using the service.
- Setting a goal button looks vague. It looks like a filter button.

### **Final Design Solution**

Our design question is 'How can we help university students to manage their finance without stress?'. It is based on results of the user study. First, users do manage their money in an abstract way such as split money into different account when an income occurred and adjusting the expenditure according to bank balance and period like a month. Second, they do not want to pay much attention to money management because they want to concentrate on studying. Third, they usually do not regret their impulsive expenditure caused by stress. Last, almost university students wish to save money for travel.

'Money Planet; is financial application that offers world map with color-coding depending on users' bank balance. Green means that user can travel well enough with current budget. The more it turns to red, the opposite. It gives a feedback like following; if you gather 'some amount' money, you can go 'specific' country with this step-by-step positive feedback. This can also offer a guide about gathering money after setting a goal (travel destination / date / period). Users can get a motivation indirectly with color-coded map.

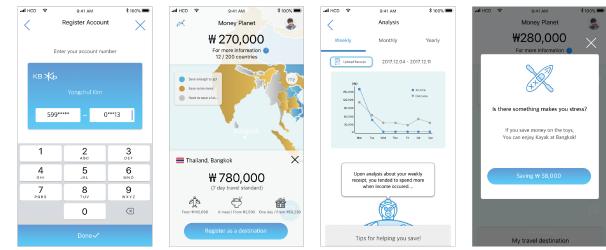


Figure 5: Final prototype design. These screens contain key functions of our application. From the left to right, registering an account, setting a goal, chart analysis and behavior nudge.

#### *Register Account*

User select the back he or she use and enter account to register bank account. With bank balance of registered

account, three levels of color are shown on the screen according to the degree of financial possibility for travel.

#### *Travel Destination Goal*

User can target travel destination based on city. Basically, 7 days travel cost is estimated at home page. In depth page, user can set specific travel periods and customize flight, good and accommodation costs depending on preference. After setting travel destination, card called as travel destination is placed under part of home screen. It shows how much money user need to collect for aimed date, the possibility also shown with three levels of color.

#### *Chart Analysis*

The service show main financial information of registered account, income and expenditure User can see financial data as a chart based on specific period, a week, a month and a year. User can also get tips for reducing expenditure. All tips are the results of the analysis of receipt data of user

#### *Behavior nudge Pop-up*

As the user do some financial activities: save or spend, the app provides pop-up window poke users to save / spend wisely money. It stimulates user to achieve their travel goal by converting extra expenditure into food or activity expenditure of travel destination.

#### **Conclusion**

Users have their own goal and way of financial management but execution of goal is not always fulfilled. As the context of university students, they think main business is studying and their incomes are not always consistent, so do not want to be suppressed by stress caused by finance management and time consumption issue. Specially, expenditure caused by stress is the one that they do not want to be bothered or interfered in. According to former words, our design solution should help them set a goal and achieve the goal by trivial financial behavior change. Inducing them

to track abstractly their detail of expenditure by feed-forward figured out through receipts, pop-up nudges will help to achieve their goal, that is traveling abroad. By mixing nudge, color coded map and setting a goal, 'Money planet' can fulfill all the design implications acquired by the research.

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