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**EVALUATION OF FINANCIAL APPLICATION SOFTWARE REPORT**

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## EXECUTIVE SUMMARY

### Background

The Consumer Expenditure (CE) Survey Program is in the initial stages of a major redesign. One area of particular interest for the redesign is the use of the latest available technology to aid in the collection of CE data. With the growing use of smartphone apps among the respondent population, CE is interested in exploring the prospects of that specific area of technology. Initial work in preparation for this project proved that CE's data needs were much too specific for any existing expense tracking app to work off the shelf. In order to collect the detailed information needed for the CE Survey, a custom app would need to be designed and developed. With that in mind, CE drafted a Statement of Work for a contractor to develop a prototype expenditure app that could be used as a replacement for the CE Diary.

This project focused on researching features and procedures that would be beneficial to implement for a custom CE app. The inputs would then be provided to the contractor for development of the app, as well as in the future as an internal reference for continued work in this area.

### Methodology

For this study, only apps that were free or that offered a free "lite" version were selected. Internal CE participants were recruited to participate in the study. Twenty participants volunteered. Ten participants were single-adult households, 4 were 2-adult households without children, and 6 were 2-adult households with children. Based on the number of volunteers and the type of devices they owned, 20 apps were selected for evaluation. Each participant was assigned a different app and asked to download the app onto their personal smartphone. Each participant was then e-mailed a Participant Booklet (see Appendix B) which included an introduction and background information about the study, instructions, examples of the detailed information required for each type of expense record, and an evaluation.

The participants were asked to use their assigned app to record their household's expenses for one week and answer the questions on the evaluation. The first section of the evaluation asks about the diary keeping experience and the second section asks about the specific app that was evaluated. See Appendix C for a compilation of the participants' individual evaluations. Most of the evaluation questions were intentionally left open-ended so that they would not generate bias or limit the participants' responses. This allowed the participants to think and report freely about the experience and what they liked or disliked about it.

In addition to the individual evaluations, a focus group was conducted to promote discussion and learn

more about the participants' experiences using the app. Due to scheduling conflicts and events beyond the team's control, only 5 participants were able to participate in the focus group. See Appendix D for notes from the focus group.

During the study, OneReceipt, a specific app which had not been available on the app market and therefore not selected for the evaluation was noted for its strong scanning and data extraction capabilities. The team made the decision not to make an exception to include the app in its evaluation in observance of the fact that new apps are constantly being introduced and that there needed to be a cut off in order to move forward with the study.

## **Major Findings**

Percent of Household's Total Expenses Recorded: Over half of the participants said that they recorded 75 percent or more of their household's total expenses for the week with 8 participants saying they recorded 90 percent.

Time of Entry: When asked "When did you enter your expenses?" the responses varied fairly evenly. 6 said immediately after the purchase, 8 said at the end of each day, 7 said every few days, and 3 said at the end of the week. (Note: Some participants selected more than one response option.)

Obtaining Expenditure Information from other Household Members: Participants were instructed to report expenditure information for their entire household, but were not given specific instructions on how to do so. Six participants said they asked and entered in the expenses themselves, 1 said they just didn't ask, 1 said that they used their checking account to verify expenses, and 1 said that both her and her husband entered expenses into the app.

Total Amount of Time Spent Using the App: The amount of time that participants spent using the app varied quite a bit. The smallest amount of time that one participant reported was 10 minutes, the greatest was 140 minutes and the average was 58 minutes (which was calculated omitting the 10 minutes reported by the participant who said that they had a 10 item limit due to using the free lite version of the app).

Willingness to Participate: When asked "Outside of this study, if you were asked to use a smartphone app custom designed to collect CE data to record your household's expenses, would you be willing to participate?", 18 said yes, 1 said no, and 1 said no unless he didn't need to do as much typing. Since 18 of the participants already owned smartphones the responses may be biased. However, two of the participants who didn't own smartphones and were using loaned devices, still said that they would be willing to participate.

Preference for Smartphone App or Paper Diary: When asked “If given a choice between recording your household’s expenses using a custom designed app on your smartphone or a paper diary, which would you prefer?” 17 preferred using a smartphone, 2 preferred a paper diary, and 1 preferred a smartphone only if it synced with a computer. The 2 participants who didn’t own smartphones preferred a smartphone app over a paper diary.

Likes about Using a Smartphone App: Overwhelmingly, the aspect that they liked most about using a smartphone app revolved around just a few similar themes: its ease, availability and portability.

Dislikes about Using a Smartphone App: The aspects for which they did not like using a smartphone app were a bit more varied. The major common themes for why participants didn’t like using a smartphone app was that it was difficult to remember to enter their expenses (which is also the case for entering expenses into a paper diary), the lack of specific diary categories and structure for reporting item details required them to do more typing and set up of their own categories, entering large numbers of expenses (e.g. items from a grocery trip) was difficult and time consuming on a small keypad, and concerns about security and privacy.

Features that should be included in a Custom Designed CE App:

- Over half of the participants felt that a smartphone app should be used in conjunction with a Web diary or a paper diary. The app was really convenient for on the spot single entries but very burdensome for entering many expenses at once. They would rather have a keyboard option for typing in a long list of purchases. If it is not possible to have a web interface, the app needs to be designed for it to be easy for a participant to enter many items (e.g. items from a grocery trip)
- Reminders to enter expenses and check with other household members
- Include “smart” features in the Description field to ease respondent burden (e.g. spell-check, auto-suggest, speech-to-text)
- Voice recorder
- Camera to photograph receipt/record with ability to parse the text to automatically pull out at least some of the information
- Barcode scanner
- Categories to match the paper diary
- Date of Purchase (an easy way for participants to enter in the date of purchase)
- User-friendly “Help” system

# 1. INTRODUCTION

## 1.1 Background

The Consumer Expenditure (CE) Surveys Program is in the initial stages of a major redesign. One area of particular interest for the redesign is the use of the latest available technology to aid the collection of CE data. Some technological advances that are of interest are the use of mobile data capture devices, in place of or in supplement to the survey's current paper diary and interview survey. Mobile data capture technologies such as personal digital assistants (PDAs), other "smart" handheld communication devices (e.g., smart phones), and receipt/barcode scanners offer a potential alternative approach for collecting expenditure data. For CE, these devices may give participants a means of self-reporting purchases at the time of purchase. At the same time, financial software might be used to passively record purchases after initial account linkage, and/or to produce an initial ledger of family spending, in response to which the participant could be asked in an interview to provide more detail on recorded purchases (e.g., for checks, which may contain information on amount and date, but not items purchased) and report additional purchases not reflected on the ledger (e.g., for cash transactions).

In 2010, CE began to pursue projects to learn more about new technology. On March 18, 2010, the Gemini Conference Team held a Data Capture Technology Forum. The team started by researching technologies that could be used to collect expenditure data, such as barcode scanners, receipt scanners and accounting/expense software. After researching a variety of technologies, the final Data Capture Technology Forum consisted of:

- NORC: internet-connected PDA, scanner imaging, and audio file capture;
- Nielsen: barcode scanner and Blackberry;
- RTI: a Blackjack and iPAQ;
- Westat: IVR and paper/electronic paper data capture.

The format of the event was a presentation/demonstration from each company, followed by a question and answer session. An estimated 70 people attended. Slides from the presentations are available on the Gemini website: <http://www.bls.gov/cex/geminimaterials.htm>.

In addition to the Data Capture Technology Forum, two demonstrations were given to the Gemini Conference Team and Gemini Steering Team. Certify, an online expense management company gave an online demonstration of their electronic wallet software, and The Neat Company, a receipts scanning company, gave an in-house demonstration of their hardware and software.

In March 2011, Westat produced the Data Capture Technologies and Financial Software for Collecting Consumer Expenditure Data Report; a research report for CE reviewing data capture devices and financial software products that were currently available on the market.

## **1.2 Objectives**

Using the Data Capture and Financial Application Report as a starting guide, CE decided to select a few of the hardware and software products reviewed to evaluate their capabilities and whether they would be applicable, and if so, beneficial for CE data collection. Originally, the primary focus of this proposed evaluation was on specific financial application software and secondarily on the devices used to run them. As the project evolved and as priorities changed for CE, the objectives of the project shifted toward a more narrow focus. Rather than focusing on both apps available on mobile devices and financial software packages available to be installed on personal computers or via the internet (e.g. Quicken and Mint.com), the project focused only on the former. With the growing use of smartphone apps among the participant population, CE is interested in exploring the prospects of that specific area of technology. Initial work in preparation for this project proved that CE's data needs were much too specific for any existing expense tracking app to work off the shelf. In order to collect the detailed information needed for the CE Survey, a custom app would need to be designed and developed. With that in mind, CE drafted a Statement of Work for a contractor to develop an expenditure app that could be used as a replacement for, or to supplement, the CE Diary.

This project focused on researching app features that would be beneficial to implement for a custom CE app. Participants were recruited to evaluate existing apps to learn about the apps' capabilities and existing features. The inputs would then be provided to the contractor for development of the prototype expenditure app.

## **1.3 Research Questions**

Although the focus of the project changed, the Research Questions originally asked in the Charter are still relevant. The questions will serve as an outline for summarizing the findings from this study.

1. Does the application meet all of the Consumer Expenditure Diary Survey (CED) data collection objectives and output requirements?

2. Does the application offer features not required by the CED but which would represent potential benefits for increasing data quality, reducing respondent burden, or reducing data collection costs?
3. What is the potential for either integrating the technology into the current CED data collection methodology, or for replacing the CED with device-based data collection?
4. Based on the evaluation of the apps and devices, what are the participants' and team's recommendations for features to be included in an expenditure app prototype specifically designed to collect CE data?
5. Based on the evaluation of internal participants' experiences with using the apps and devices to record their expense, what are the team's recommendations for a feasibility test?

## **2. METHODOLOGY**

### **2.1 Study Design**

The team conducted a scan of the current market and identified 96 expense tracking apps that could potentially meet CE's data collection needs or include features of interest for a custom CE app (See Appendix A). For this study, only apps that were free or offered a free "lite" version were selected. The 96 apps were then divided among 2 team members who conducted a basic review of the app to recommend whether the app should or shouldn't be candidates for further evaluation.

Next, the team sent an e-mail to CE staff to ask for volunteers for the study.



TO: CE\_All  
SUBJECT: The CE EFAS Team needs your help!

Hello,

The CE Evaluation of Financial Application Software Team (EFAS) would like to request your help in an upcoming study.

We are looking for individuals who currently own a smartphone to participate. As a participant, you will be asked to install a free app on your smartphone and use it to keep track of your household's expenses for one week. We will not be asking you to provide us with any of the personal data entered; we are only interested in learning about your "diary keeping" experience using the app and your evaluation of the particular app itself.

The study will be conducted during the last few weeks in June. Please let us know by **June 12th** if you are willing to participate in the study and if so, which specific smartphone you own (e.g. iPhone, Blackberry).

The results of this study will be used to inform an upcoming contract with a vendor to custom design a prototype app for CE.

Thank you,  
Nhien To, for the CE EFAS Team

Twenty participants volunteered. Based on the number of volunteers and the type of devices they owned, the list of apps selected for further evaluation were prioritized and the top 20 selected. Each participant was then assigned a different app and asked to download the app onto their personal smartphone.

Table 1. The 20 Apps Evaluated in the Study

Operating System	App Name	Vendor
Android	AndroMoney	Andromoney
Android	Coin Keeper	i-Free Inovations
Android	CW Money Expense Track	Cwmoney.net
Android	Droid Wallet	William Bruno
Android	EasyMoney	Handy Apps Inc.
Android	ExpenseManager	Bishinews
Android	Home Budget with Sync Lite	Anishu
Android	Monthly Budget	BRL soft
Blackberry	Expense Cloud	App7, Inc.
Blackberry	Money Lover	Bookmark
HTC	Certify Wallet	Circle Point Solutions, Inc.
iOS	ExpenseRec2 Free	Ryoichi Shinbori
iOS	iXpensis Lite	FYI Mobileware, Inc.
iOS	Money Care Lite	Alessandro Figueired

Table 1. The 20 Apps Evaluated in the Study

Operating System	App Name	Vendor
iOS	MoneyZoom	Direct Capital Group
iOS	OneExpense LT	digitelematica
iOS	Pico Spend Lite	Dejan Petrovski
iOS	ProOnGo	ProOnGo LLC
iOS	Spending Lite	Tekton Technologies
iOS	Xtrack - The Expense Tracker Lite	e-Zenit s.r.l.

Each participant was e-mailed a Participant Booklet (see Appendix B) which included an introduction and background information about the study, instructions, examples of the detailed information required for each type of expense record, and a 2 page evaluation.

During the study, OneReceipt, a specific app which had not been available on the app market and therefore not selected for the evaluation was noted for its strong scanning and data extraction capabilities. The team made the decision not to make an exception to include the app in its evaluation in observance of the fact that new apps are constantly being introduced and that there needed to be a cut off in order to move forward with the study.

## 2.2 Evaluations

Participants were asked to use their assigned app to record their household's expenses for one week and then answer the questions on the evaluation. The first section of the evaluation asks about the general diary keeping experience and the second section asks about the specific app that was evaluated. See Appendix C for a compilation of the individual evaluations.

Most of the evaluation questions were intentionally left open-ended so that they would not limit the participants' responses. This allowed the participants to think and report freely about the experience and what they liked or disliked about it.

In addition to the individual evaluations, a focus group was conducted to promote discussion and learn more about the participants' experiences using the app. Due to scheduling conflicts and events beyond the team's control, only 5 participants were able to participate in the focus group. See Appendix D for notes from the focus group.

### 3. FINDINGS

The feedback obtained from the focus group and from the individual evaluations will be summarized and used to recommend features for a custom CE app. It should be noted that the questions asked on the evaluations were mostly open ended, which means that the participants comments were quite varied so not every point is mentioned in this report (See Appendix C for a comprehensive documentation of all the comments from the participants' individual evaluations). The fact that the questions were open ended also emphasizes the importance of the recommendations as they were not predisposed to any study influences. For this reason, if a specific recommendation is mentioned by multiple participants it may present a greater strength for that recommendation.

#### 3.1 Household Composition

Of the 20 participants, 10 participants were single-adult households, 4 were 2-adult households without children, and 6 were 2-adult households with children.

#### 3.2 Percent of Household's Total Expenses Recorded

Over half of the participants said that they recorded 75 percent or more of their household's total expenses for the week with 8 participants saying they recorded 90 percent.

Table 2. Of your household's total expenses for the week, about how much do you think you actually recorded using the app?

	N
None	0
10%	4*
25%	2
50%	1
75%	5
90%	8
100%	0

\*1 of the participants who responded 10% only did so because the app they used only allowed 10 entries in the free lite version.

### 3.3. Time of Entry

When asked “When did you enter your expenses?” the responses varied fairly evenly. 6 participants said Immediately after the purchase, 8 said At the end of the day, 7 said Every few days, and 3 said At the end of the week.

Table 3. When did you enter your expenses?

	N
Immediately after the purchase	6
At the end of each day	8
Every few days	7
At the end of the week	3

\*Note: Some participants selected more than one response option.

### 3.4 Obtaining Expenditure Information from other Household Members

Since CE is interested in the expenses of all members of the household, it was important to learn how participants obtained expenditure information from other household members. Participants were instructed to report expenditure information for their entire household, but were not given specific instructions on how to do so. Six participants said they asked and entered in the expenses themselves, 1 said they just didn’t ask, 1 said that they used their checking account to verify expenses, and 1 said that both her and her husband entered items into the app.

### 3.5 Total Amount of Time Spent Using the App

The amount of time that participants spent using the app varied quite a bit. The smallest amount of time that one participant reported was 10 minutes, the greatest was 140 minutes and the average was 58 minutes (which was calculated omitting the 10 minutes reported by the participant who said that they had a 10 item limit due to using the free lite version of the app).

### **3.6 Willingness to Participate**

When asked “Outside of this study, if you were asked to use a smartphone app custom designed to collect CE data to record your household’s expenses, would you be willing to participate?”, 18 said yes, 1 said no, and 1 said no unless he didn’t need to do as much typing. Since 18 of the participants already owned smartphones the responses may be biased. However, 2 of the participants who didn’t own smartphones and were using loaned devices, still said that they would be willing to participate.

### **3.7 Preference for Smartphone App or Paper Diary**

When asked “If given a choice between recording your household’s expenses using a custom designed app on your smartphone or a paper diary, which would you prefer?”, 17 preferred using a smartphone, 2 preferred a paper diary, and 1 preferred a smartphone only if it synced with a computer. The 2 participants who didn’t own smartphones said that they preferred a smartphone app over a paper diary.

### **3.8 Likes about Using a Smartphone App**

Overwhelmingly, the aspect that the participants liked most about using a smartphone app revolved around just a few common themes: its ease, availability and portability.

- “I don’t need to wait to get home to record my expenses.”
- “Even though I entered my expenses at the end of the day; I can see the benefit of recording expenses immediately after purchasing items.”
- “Availability and Portability”
- “Since I carry my phone everywhere, it was easy to enter my expenses immediately, and be done with it.”
- “Accessibility”
- “Ease of use”
- “Flexibility of using it anytime after incurring the expense.”
- “Entering data was fast and fun.”
- “The app is very well organized and easy to use.”
- “It was nice to have it with me so I could plug in my lunch costs right away.”
- “I always have my phone handy, so if I want to enter an expenditure at any time I can.”

- “Very accessible, it is always with you.”
- “I always have my phone with me, so I could enter the info whenever I had time (I like doing things like this on my commute).”
- “It was very handy to have it on my phone for „on the spot“ one expense entries like a meal away from home or a snack.”
- “In general, the smartphone application made it much more efficient to record expenses immediately after purchase (or closely thereafter) than it would be with a regular paper diary. Data entry was quick and display was relatively well organized.”
- “It was on me all the time.”

### 3.9 Dislikes about Using a Smartphone App

The aspects for which they did not like using a smartphone app were a bit more varied. The major common themes for why participants didn’t like using a smartphone app was that it was difficult to remember to enter their expenses, the lack of specific diary categories and structure for reporting item details required them to do more typing and set up of their own categories, entering large numbers of expenses (e.g. items from a grocery trip) was difficult and time consuming on a small keypad, and concerns about security and privacy.

#### Difficult to remember

- “It was easy to forget since it (the app) was not something I previously used on a regular basis, and the app was not something I saw regularly either. I had to remember to open it.”
- “It is easily forgettable.”
- “I also didn’t like that I kept forgetting I was participating. I thought I was being smart by putting the icon in a place where I’d see it every time I used my phone, but I still forgot.”
- “It is still easy to forget to record everything.”
- “Forgot to log some expenses. Forgot to constantly update the info.”
- “Built-in reminders (like ones that come up for other apps).”
- “Have a popup or reminder saying „Did you purchase anything recently? Write it down!“”

### Lack of specific diary categories and structure for reporting item details

- “The categories that my app provided were way too general. I didn’t like having to constantly create categories. For example, I created medical, specific fruits from the grocery store, etc.”
- “Also, you can’t add variables, for example who it is for or tax or alcohol included. Everything would have to be pushed into notes or there would be a LOT of subcategories that would have to be created for each item.”
- “Overall, I liked the smartphone app compared to the paper diary, but it would be beneficial to have one that is set up with CE’s diary categories already provided.”
- “It would have been easier if the app had sub-categories, not only the main categories.”
- “I was satisfied with my experience. Having more spending categories, and fillable buttons (eg. for frozen food, canned food, etc.) would be useful.”

### Entering large numbers of expenses

- “When there was a large number of expenses (e.g., after a trip to the grocery store), it was tedious to enter each item – would have been faster for me to use paper.”
- “There was a lot of typing, especially for grocery receipts.”
- “It takes a while to itemize everything bought, especially for a grocery bill.”
- “It was very cumbersome to use the app for entering many expenses such as weekly groceries.”

### Concerns about security and privacy

- “Even though it was a free app, I still had to type in an e-mail address. I didn’t read the terms and conditions but I have some concern that my info will be used for marketing”
- “It was fun exploring the software but I was suspicious of software security and the upload of my data to the „cloud“”

### 3.10 Likes about the Specific App Used

When asked about the specific apps they used, the features they liked were:

- “Organization and presentation of expenditures was a nice touch. The application seemed overall well thought out. Integration with the camera’s phone worked well.” (Home Budget with Sync Lite)
- “Liked the voice recognition feature, it was much easier than typing on that small keyboard.” Voice-to-text (Money Lover)
- “Ease of editing Expenses.” (Spending Lite)
- “Ease of use” (CW Money Expense Track)
- “Taking photos of expense records and receipts but it could be functioning better.” (Expense Manager)
- “Running list of transactions on the first screen.” (Money Care Lite)
- “The tax function was helpful for making sure that when I broke down transactions into individual items the total came out of what was on the receipt. The tax function didn't work properly in the app but I'm not sure if that is because it's the free version or not.” (ProOnGo)
- “I liked that the app has a customizable set of pre-specified expense categories, and that these are easy to access through a scrolling menu display.” (Pico Spend Lite)
- “The edit feature available directly on the report/review screen is nice – you can easily change the description, amount, and date of purchases.” (Pico Spend Lite)
- “The Help items were informative and not overwhelming.” (Pico Spend Lite)
- “It offers a recurring transactions feature for monthly expenses.” (Spending Lite)
- “The cell phone camera filling in some of the data was cool.” (ProOnGo)
- “The ability to read date, vendor, and total cost from receipts was pretty amazing though it did take awhile.” (ProOnGo)

One major common feature that many participants mentioned liking came from some of the more budget centered apps which allowed them to see summaries or charts of their spending. Since it is favored by so many participants, including a feature like this could be used as an incentive but it risks causing a Hawthorn Effect in which participants may change their spending behavior in reaction to seeing their spending.



Comments made about the budget summaries and charts were:

- “I liked the daily summaries, and the ability to export it to PDF.”
- “The budgeting feature and related summary reports were the best I’ve used on my iPhone (cleanest and easiest to produce)”
- “I like that it gave me instant feedback in the form of charts.”
- “I also liked that the app totaled up spending for each category, so I could get the benefit of seeing how much I spend for each category each week.”
- “I had access to an easy log of what exactly I was spending money on. It made me more conscious of where money was being spent.”
- “Graphical breakdown of where money is spent by category.”
- “I liked that I was able to enter a budget, and then see if my expenditures were within budget. I also liked that the app totaled up my spending for each category.”
- “Visualization/summary of the expenses that I wouldn’t realize otherwise. Generally this sort of report is sent by the credit card companies at the end of a financial year. Here you have the option to see it anytime.”
- “The summary reports (daily and longer) are nice”
- “It should definitely give feedback to the user in the form of graphs, charts, and tables this would be an added incentive for participants to use it.”

### **3.11 Dislikes about the Specific App Used**

Aside from the general disadvantages of using a smartphone app that were already mentioned, the features that they did not like about the specific apps they used were fairly minimal.

- “Some of the graphics look a little cheap, blurry.”
- “The screen did not re-orient – it was only available in „portrait“ mode, but sometimes I like to do text entry from the wider/landscape position.”
- “Text entry didn’t auto-correct/suggest spelling, and did not remember past entries so I had to retype things over and over for recurring purchases or purchases of similar items.”
- “There was no (obvious) way to share the app with other HH members (e.g., so my wife and I could both have it on our phones, and make our own entries on an integrated account).”

### **3.12 Entry of Detailed Information for each Expense**

Since none of the apps were designed to collect specific CE data, we asked “Did you enter in all the required detailed information from page 4 of the Participant Booklet (e.g. alcohol costs for meals away from home, packaging type for grocery items, age and sex for clothing purchases) and if so, how did you do it?” Most of the participants said that they did not enter in all of the details with specifications of “Some but not all” and “Not always” and gave reasons such as “No, too much work” or “No structured way to enter”

### **3.13 Features that should be included in a Custom Designed CE App**

Two major recommendations echoed among many of the participants. The first was remembering to use the app at all and the second was the preference to have the smartphone app be used in conjunction with a Web interface.

Even though many participants said that they liked using the smartphone app to enter expenses, 7 participants expressed that it was difficult for them to remember to use it. Many of them recommended using a prompt or series of customizable prompts to remind them to enter their expenses as well as prompts to check with other household members. These could be push-notices that pop-up on the screen once daily or several times a day.

- “It was easy to forget since it (the app) was not something I previously used on a regular basis, and the app was not something I saw regularly either. I had to remember to open it.”
- “I also didn’t like that I kept forgetting I was participating. I thought I was being smart by putting the icon in a place where I’d see it every time I used my phone, but I still forgot.”

Over half of the participants felt that the smartphone app should be used in conjunction with a Web diary or a paper diary. The app was really convenient for on the spot single entries but very burdensome for entering many expenses at once (e.g. items from a grocery trip). They would rather have a keyboard option for typing in a long list of purchases. One participant mentioned that typing in many items on the small keypad caused a lot of typing mistakes, which would compromise data quality.

- “Prefer computer/mouse over phone display/keypad”
- “I like to use a mouse, so I prefer websites over apps. I mean, I had to go into the website first so I could figure it out anyway.”
- “Can’t sync to my desktop”

- “By nature of it being a smartphone, it was somewhat harder to do than the web diary. “
- “Smartphone screens are tiny (and subsequently, have tiny keyboards) making extended data entry tiring / cumbersome.”
- “It would be great if the app shared an interface with either a desktop program or website. Typing on the little keyboard was tedious.”
- “Having a PC / Web application paired with the smartphone application that would allow deferral of larger or more complicated entries into a more comfortable environment would make the experience all the more robust.”
- “I’d rather use the computer website rather than a smartphone app. I like to use a mouse rather than getting finger cramping from the apps. My last preference is a paper diary, though.”
- “The hardest part was entering data on the phone. For the first few days I tried entering my answers using the pop-up touch keyboard on the screen. This caused a lot of typing mistakes.”
- “Having a PC / Web application paired with the smartphone application that would allow deferral of larger or more complicated entries into a more comfortable environment would make the experience all the more robust.”

Other features participants recommended including were:

- Include “smart” features in the Description field to ease respondent burden
  - spell-check
  - auto-suggest
  - speech-to-text
- Easy entry of recurring items
- Voice recorder
- Camera to photograph receipt/record
  - ability to parse the text to automatically pull out at least some of the information
  - caution that users may over-rely on it – e.g., take a picture rather than enter detailed information. So, the digital capture would need to be sufficiently sophisticated – i.e., either automatically extract necessary information OR be integrated into the data entry feature in such a way as to ease respondent burden (e.g., through OCR; having receipt available on a portion of the data entry screen to prompt recall; etc.).
- Barcode scanner
- Automatic sales tax calculator

- ability to entered the participant’s local sales tax rate, like 6 percent and for items that were taxed, check a certain box, enter a product’s original price, like \$5.99, and it adds the tax automatically
- Categories to match the paper diary
  - participant shouldn’t have to do any setup (i.e., like adding categories) beyond personalizing it to suit their tastes
- Date of Purchase
  - an easy way for participants to enter in the date of purchase
- Re-orient the screen between „portrait“ and „landscape“ mode – especially for use with a built in keyboard
- User-friendly “Help” system.
  - links to clear step-by-step graphics (with screen shot examples)
  - video (youtube) demonstrations
  - an easy way to email/text questions (and get a timely response from FR!) within the system (e.g., “You have one response/message in your inbox.”)

### **3.14 Field Procedures for Implementing a CE App**

Participants were asked “If CE was to use a smartphone app to collect CE Data what procedures would be best suited for respondents?”

- Participants should use their own smartphones since most participants would not want to have to carry around a second phone just for CE.
- While many participants agreed that it would be beneficial to let each member use their own smartphone to enter their expenses to ease the burden on one household reporter, it was also noted that this would make it more difficult to prevent double reporting of the same expense and may lead to less diligent reporting as members would assume someone else will do it.
- Since different household members may be using different types of phones, it would be important to make the app function seamlessly across multiple platforms.
- Consider using some sort of incentive system
- Minimize and/or address concerns about security/privacy. This is especially problematic for gaining participation from people who are worried the government is monitoring them.

- Provide some type of visual reminder. Create something to be a visual reminder (e.g. a refrigerator magnet or something on paper that a participant can have sitting out as a reminder of participation even if no data are collected on paper).

## **4. CONCLUSION**

The findings from this study will be summarized in the form of responses to the 5 research questions that were originally stated in the project charter.

### **4.1 Does the application meet all of the Consumer Expenditure Diary Survey (CED) data collection objectives and output requirements?**

None of the apps are able to meet all of the CED's data collection needs as they exist off the shelf. The major deficiency that all the apps have is the inability to easily enter detailed information about a specific purchase (e.g. whether the shirt was purchased for a male or female or whether the broccoli was fresh or frozen). This information technically could be captured by having the participant type them into a notes or description field, but it would require very detailed instructions and for the participant to manually type them on the small keypad of the smartphone (both of which would be extremely burdensome). In addition it would be difficult to parse this information into useable variables for CE data output.

On the other hand, because many of the apps had other purposes in mind – reporting business expenses for reimbursement or budget information for saving money, it does sometimes ask for a lot of other detailed information (e.g. expense category, reimbursable, billable) which is evidence that an app could be customized and programmed to ask for the detailed information that CE is interested in. The way in which that detailed information is asked or displayed could provide ideas for how CE could ask for its detailed information.

The sample output that was available through many of the apps provide potential ideas for how CE may want to customize its output requirements, the information entered can be in many cases outputted as a CSV file or an excel spreadsheet and can be very sophisticated. For example, an individual's business expense reports can be nicely formatted and submitted directly to the

appropriate manager or accounting department and require no further action from the employee. For apps that are focused on budget needs, the data entered can be output to create nice graphs and charts. Some participants might be interested in seeing this information and it could be an incentive for them to use the app. However, the downside is that it may produce a Hawthorn effect and cause them to change their spending behavior.

#### **4.2 Does the application offer features not required by the CED but which would represent potential benefits for increasing data quality, reducing respondent burden, or reducing data collection costs?**

The apps offer many features that are not required by the CED but could potentially benefit to help increase data quality, reduce respondent burden, and reduce data collection costs.

The ability to capture a photo of a receipt or to photograph a purchased item can help to increase data quality by serving as a memento or for clarification if an entry is questionable later. For example, if the participant purchases a hotdog, a bag of chips, and a soda from a street vendor that only accepts cash and doesn't offer a receipt, and he's in a rush and doesn't have time to enter the details of the purchase, he could take a photograph of the items purchased to remind him about the expense later. In this example, there are many factors that could have made the purchase easily forgettable – being a cash purchase there is no credit card record on a statement or receipt and since it is food that is consumed, there is no tangible product that can be seen later as a reminder (i.e. as opposed to the purchase of an article of clothing or book). Having a photograph of the items purchased in this instance would increase accuracy and decrease recall burden.

In a situation where a receipt is available and the participant chooses to photograph the receipt, in addition to serving as a memento, it can help verify questionable data later. For example, the participant may enter an unusually high amount for the hotdog (\$22.50) and upon checking the receipt, he may be able to see that he accidentally entered a typo and it was suppose to only be \$2.50.

One of the apps evaluated, Certify.com, allows participants to enter information via multiple smartphones or via the web. This would allow multiple family members to enter information into the same account using a common login and password. This would reduce the burden on one main

household participant by allowing household members to enter their own expenses and see what others have entered to avoid double reporting.

Allowing participants to enter the data themselves would reduce collection costs since it would not require coders for data entry. In addition, electronic record keeping makes using the data easier because there's no keying involved and no handwriting to try and puzzle out.

Some apps have alerts that can be pushed to the screen. This would serve as reminders and would not require interviewers to call and remind the participant. A daily call from an interviewer would seem much more intrusive than a daily message that pops-up on the participant's screen.

Once the app is created, it would only require maintenance and updates if participants use their own smartphones and would not incur the cost of printing diaries.

#### **4.3 What is the potential for either integrating the technology into the current CED data collection methodology, or for replacing the CED with device-based data collection?**

There are limitless options for integrating a smartphone app into the current CED data collection methodology. At a minimum, the app can serve to capture mementos of purchases at the time of purchase and used for reference to enter more completely into a paper or web diary at a later time. However, it is also possible to develop the app more fully to replace the diary altogether. A participant can use the app (perhaps in conjunction with a web version that syncs with entries made in the app) to record all of the household's expenditures. At present, it may be necessary to still offer a paper and pencil option for those unfamiliar or unwilling to use a smartphone (or if they don't own a smartphone in a Bring Your Own Device data collection environment), but as technology and users progress, this may change.

#### **4.4 Based on the evaluation of the apps and devices, what are the participants' and team's recommendations for features to be included in an expenditure app prototype specifically designed to collect CE data?**

- Over half of the participants felt that a smartphone app should only be used in conjunction with a Web diary (or a paper diary). The app was really convenient for on the spot single entries but very burdensome for entering many expenses at once. They would rather have a keyboard option for typing in a long list of purchases.
- If it is not possible to have a web interface, the app needs to be designed for the participant to be able to easily enter many items (e.g. items from a grocery trip)
- Reminder system
  - a prompt or series of customizable prompts that asked me if I had any expenses to enter
  - a prompt to check with other household members
- Include “smart” features in the Description field to ease respondent burden by minimizing the need to type.
  - spell-check
  - auto-suggest
  - speech-to-text
- Voice recorder
- Camera to photograph receipt/record
  - ability to parse the text to automatically pull out at least some of the information
  - caution that users may over-rely on it – e.g., take a picture rather than enter detailed information. So, the digital capture would need to be sufficiently sophisticated – i.e., either automatically extract necessary information OR be integrated into the data entry feature in such a way as to ease respondent burden (e.g., through OCR; having receipt available on a portion of the data entry screen to prompt recall; etc.).
- Barcode scanner
- Automatic sales tax calculator
  - ability to entered the participant’s local sales tax rate, like 6 percent and for items that were taxed, check a certain box, enter a product’s original price, like \$5.99, and it adds the tax automatically
- Categories to match the paper diary.
  - participant shouldn’t have to do any setup (i.e., like adding categories) beyond personalizing it to suit their tastes.



- Date of Purchase
  - an easy way for participants to enter in the date of purchase
- User-friendly “Help” system.
  - links to clear step-by-step graphics (with screen shot examples)
  - video (e.g. YouTube) demonstrations
  - an easy way to email/text questions (and get a timely response from FR!) within the system (e.g., “You have one response/message in your inbox.”)

**4.5 Based on the evaluation of internal participants’ experiences with using the apps and devices to record their expense, what are the team’s recommendations for a feasibility test?**

- Participants should use their own smartphones since most participants would not want to have to carry around a second phone just for CE. One participant commented that “My phone is very slow, so sometimes I don’t feel like opening the app to record things.” We have to consider this as a possible downside to having participants use their own phones.
- Consider how to measure or control the bias from only collecting expenses from participants who own their own smartphones.
- While many participants agreed that it would be beneficial to let each member use their own smartphone to enter their expenses to ease the burden on one household reporter, it was also noted that this would make it more difficult to prevent double reporting of the same expense and may lead to less diligent reporting as members would assume someone else will do it.
- Since different household members may be using different types of phones, it would be important to make the app function seamlessly across multiple platforms.
- Many participants agreed that it was difficult to remember to use the app to enter their expenses and agreed that having a daily reminder set for entering expenses and checking with household members would be helpful. Attempt to measure whether the automatic reminders really work as opposed to an interviewer calling. Reminders could easily be ignored as opposed to a call.
- Consider using some sort of incentive system. Not necessarily cash. Perhaps points to purchase apps or games or to keep the CE app on their phone? Not sure about this – OMB probably would not like it, and we’d need to look at the incentives/engagement literature more closely – but a participant felt like he spent considerable energy gathering and entering expenses for the week, and it would have been nice to get some sort of nominal but tangible „thank you“ at the end, or even perhaps half-way through if he was doing a „good job“ (however defined).

- Alleviate concerns about security/privacy. This is especially problematic for gaining participation from people who are worried the government is monitoring them.
- Provide some type of visual reminder. Create something to be a visual reminder (e.g. a refrigerator magnet or something on paper that a participant can have sitting out as a reminder of participation even if no data are collected on paper).

## 5. REFERENCES

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**APPENDIX A. Initial list of 96 free expense tracking apps that could potentially meet CE’s data collection needs or include features of interest for a custom CE app. The apps were found using internet search engines and searches of the app stores for the respective devices/operating systems.**

App	Device				Select for evaluation?		Reason for not being selected			
	iPhone	Android	Blackberry	WebOS	selected	not selected	requires access to accounts	too business oriented	functionality is too limited	other/notes
Account Book	x	x	x		x					goes to a new screen each time you enter an aspect of the expense. This allows you to show examples and provide more detail for each aspect of the entry (e.g. for vendor - you can list a bunch of different vendors as examples) but is time consuming. Pro or con?
Account Tracker	x				x					Also known as AccountsFree, nothing special, but good functionality.
Ace budget	x					x				Not truly free.. You only get 20 transactions.
aFinance Budget Free	x				x					Not a lot here, but nicely streamlines to fit on a phone and quickly enter information, also liked password option.
Best Budget Free	x				x					Somewhat simple, but liked camera option. Rough around the edges.
Bill Tracker Free	x					x				When opened got spam pop-up. Will not open again.
Billings Touch	x					x		x		Way to business focused, but liked that you could sync it with your computer and tax information.
BOSS Expense Tracker	x					x		x		Also, called tax track. Business expense focused and bordering on too simple.
Budget Book		x				x		x		Euro centric, tried to make US centric, but was too difficult
budget booklet	x					x		x		Way too simple. Also called Home Budget.
Budget Me Free	x				x					Good use of screen space, simple yet worthwhile.
Budget Tracker	x		x			x				checkbook oriented - basically an account ledger
Budget! Lite	x					x				Wouldn't work
BudgetIT	x					x				Couldn't find
Budgetize	x					x				the first thing it does is require you to set up budgets
Captoom	x	x	x	x		x		x		geared towards business travel
Cashbook Expense Tracker	x	x				x				Could not find free version for Android, app is \$4.99
Cashish	x					x				no longer available for free
Certify Wallet	x	x	x	x		x		x		for each entry, you always have to select for "reimbursable" or "billable"
concur	x	x	x			x				geared towards travel
Cut Expenses	x					x			x	too simple, amounts are preset \$3, \$5, \$10
Droid Wallet		x			x					Easy to use, may be too limited, but worth further review by team members. Does not have picture functionality.

App	Device				Select for evaluation?		Reason for not being selected			
	iPhone	Android	Blackberry	WebOS	selected	not selected	requires access to accounts	too business oriented	functionality is too limited	other/notes
Easy Spending	x				x					may be too simple but worth checking out
EasyBudget	x	x	x	x		x				no longer available for free
EasyMoney		x			x					Really well done and the most robust of the apps that I have tested. I liked how you could split by type of payment and the bill reminder.
Exgis Expense Tracker			x			x				no longer available
ExpensAble Mobile	x	x	x			x	x			requires your company to use it and be a "user" for you to access
Expense control		x	x	x		x				no longer available
Expense IT		x				x	x			Seemed robust, but too business focused. Also, only first 25 days are free.
Expense Management	x				x					this could use special team review, as it doesn't work for ce but the set up is interesting and worth checking out. It's organized by "accounts" - perhaps instead ce could use the setup and replace "accounts" with "categories"
Expense Manager	x	x			x					Worthwhile app. Has camera functionality, expense/income reporting, and you can schedule a repeating transaction.
Expense Plus		x	x			x				no longer available
Expense Recorder			x			x				no longer available
ExpenseCloud	x	x	x			x	x			too business oriented and not very customizable
ExpenseRec	x					x		x		same as ExpenseRec2, but more limited
ExpenseRec2	x				x					highly customizable
Expenses Lite	x					x		x		way too simple. Does not show individual entries after it's been added - just the cumulative
Expenses Tracker	x					x				too many ads (that cover the function buttons) and too cluttered with icons
ExpenseWatch Mobile	x	x	x			x	x			designed for creating business expense reports
Expensify	x	x	x	x		x	x			too business oriented and not very customizable
Ez Budget Envelopes	x					x				too budget oriented
FGB Budgeter	x		x			x		x		too limited
Financisto		x				X				Seems fine except that it makes you put a starting amount of money which I doubt respondents want to do.
Flash Money Manager		x			x			x		Too limited, but use of voice commands worth testing.
Free Home Budget	x					x				too budget oriented and monthly oriented
FYI Expense Tracker			x			x				budget oriented and also has a poorly designed interface - too cluttered and not useful
Hello Expense		x				x		x		Too limited.

App	Device				Select for evaluation?		Reason for not being selected			
	iPhone	Android	Blackberry	WebOS	selected	not selected	requires access to accounts	too business oriented	functionality is too limited	other/notes
Home Budget	x	x	x		x					allows you to split an expense but the interface is poorly designed, worth checking out and learning from
iMoney Tracker	x				x					not a great layout but worth checking out. The full version allows you to customize the categories
iSpend	x	x	x			x			x	too limited
iSpent	x				x					allows you to customize categories and HH members
iSUM	x					x				no longer available for free
iXpenseit	x				x					has a category and subcategory option, but may be too complicated
Lemon	x	x	x	x		x			x	captures receipt totals, cannot itemize
Mastro Bolletta			x			x			x	too limited
Memo 4 the Household		x				x			x	Too limited, but foreign language ads are interesting...
Mind Your Money	x					x				too budget oriented
MM	x	x				x				Couldn't find
Money Care	x				x					attractive interface, some unique ideas
Money Journal	x				x					interesting user interface
Money Lover - Expense Manager	x	x			x					Robust app; however, annoying reminders about account stuff hinders operation and may be annoying for respondents.
Money Manager	x	x				x	x		x	There are a number of Money manager apps, many of which are not free. Seems to want your account information to be able to do anything and it's not very robust, password feature is nice though
Money Smart	x				x					too budget oriented to use as is and may require too much detail, but it's highly customizable and worth checking for ideas
Money Tracker	x	x	x		x					simple, easy to use - worth checking out.
MoneyCalc	x	x				x			x	Doesn't really add anything or do anything better
MoneyMenttor			x			x	x			does not connect to actual account but requires you to select an account money is coming from
MoneyNote	x					x				screen is too cluttered and not userfriendly. An example of what NOT to do?
MoneyZoom	x				x					too budget oriented but can customize categories and sync with an online account
Monthly Budget		x			x					Nice start screen, also allows for data backup
myExpenses	x					x			x	too basic
Nice Money Book		x			x					Good flexibility and options; however, may be too difficult to use and may have too much going on the screen.
OneExpense LT	x				x					simple, but may be in a good way and is customizable

App	Device				Select for evaluation?		Reason for not being selected			
	iPhone	Android	Blackberry	WebOS	selected	not selected	requires access to accounts	too business oriented	functionality is too limited	other/notes
Pennies	x					x				no longer available for free
Pico Spend	x				x					has an interesting category column on the side to scroll down and select
Piggie	x					x			x	too simplistic
Plendi Expense Tracker	x	x	x			x				it's not really free. There is a trial period to capture your receipts but in order to access them at the end of the trial you have to pay. The idea is different though. You take a photo of a receipt, send it to them, and a real person on their end types up the info and puts it into your account.
Pocket Expense	x					x				too budget oriented
Pocket Garage	x					x				literally about cars, not expenses
pocketmoneylite	x					x				too budget oriented
PriFi2go		x				x				Couldn't find
ProOnGo	x	x	x		x					can read a receipt and allows you to split an expense
Quick Receipt X	x					x				no longer available for free
Receipts	x				x					lots of customization options available
Shared Expense Book			x			x				no longer available
SJH Money Manager			x			x				no longer available
Spending	x				x					interesting screen by screen entry idea
T2Expense		x				x				Starting screen is too busy. Plus, doesn't seem to run very well on my phone, and I have a newer phone.
Toshl Finance	x	x				x				Requires email account information, did not feel comfortable giving out this information to random phone app., looked like it might have potential.
Touch Money	x					x				not a user friendly interface
Unvired Expense Manager			x			x				requires registration to connect to Unvired server and the blackberry wouldn't connect
Venmo	x					x				designed for making/collecting payments from other people by linking a credit card to the account
Where is my Money	x	x	x			x				no longer available for free
Xpenser	x	x	x	x		x				no longer available
Xtrack	x				x					category interface is interesting

Expenditure App Study

# Participant Booklet

CE Evaluation of Financial Application Software Team



## **Thank you for agreeing to participate in this study!**

For this study, you are asked to download an assigned app to your smartphone which you will use to record your household's expenses for 1 week.

The purpose of this study is two-fold:

1. To learn about the general "diary keeping" experience using an app.
2. To learn about specific app features that would or would not be beneficial for collecting CE data.

Each participant will be assigned a different app with the goal of gaining insight into a wide variety of existing ideas and features. The apps selected are free, off-the-shelf apps and are therefore not catered to collecting CE specific data. As a result you, as a participant, will likely spend some of your time "playing" with the app and considering ways in which it could be customized to meet a CE respondent's expense reporting needs. Since some of the apps were designed to report business expenses or for maintaining a budget, it may have features that you will either need to ignore or it may give you ideas for how those aspects could be altered to suit CE's needs. In some cases you may need to enter a fictitious budget or add expense categories for it to work. Also, because they are free they may have pop-ups to ask you to purchase the full version or have ads along the sides of the screen – please ignore these. The lessons learned from this study will be used to inform an upcoming contract with a vendor to custom design a prototype app for CE.

### **Instructions:**

1. Download the specified App onto your smartphone. Check to be sure it is the Lite/Free version (You will not be reimbursed for any apps you pay for).
2. Fill in the information on Page 2 of this booklet.
  - a. Pick a day to begin recording your expenses (no later than Monday, June 25, 2012)
  - b. List the names of the people in your household and record the expenses for everyone listed.
3. Familiarize yourself with the information on Pages 3-4.
4. Using the app, record your expenses for 1 week. We will not be asking you for the data you enter – just that you complete an evaluation form and participate in a focus group after you complete the week.
5. During the week, if you have any thoughts, comments, or questions about the experience or about the app itself, please note them on the last page of this booklet.
6. Complete the Evaluations on Pages 5-6. Page 5 asks you to evaluate the general "diary keeping" experience while Page 6 asks you to evaluate the specific app that you used.
7. Once you have completed the Evaluations, please e-mail the booklet to me.
8. If at any point during the week, you have any questions please feel free to contact me at 202.691.6866 or e-mail: [to.nhien@bls.gov](mailto:to.nhien@bls.gov).

Participant Name: \_\_\_\_\_

App Name: \_\_\_\_\_

Device: \_\_\_\_\_

**Recording Period:**

Start Date: \_\_\_\_\_ End Date: \_\_\_\_\_

**Household Members:**

The members of your household that you will be recording expenses for are:

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

## Entry Level Details

Every app is different and has specific features and options. Your app may or may not allow you to customize the categories or other characteristics. In either case, we would like you to attempt to enter your expenses with the detailed characteristics currently collected in the paper diary. Page 4 shows sample pages from a diary and the level of detail that is asked for. Below is also a summary of the detailed information needed. In many cases, this information may simply need to be entered in the “description”, “notes”, or a “memo” field in the app. However, if your app allows you to customize categories, create subcategories, or make any other modifications to help report these details, please do as much as you are willing to.

### **I. Food and Drinks Away from Home**

1. Description of what was purchased
2. Total Cost *with tax and tip*
3. Meal Type: breakfast, lunch, dinner, or snack/other
4. Vendor: Fast-Food, Take-Out, Delivery, or Concession; Full-Service Places; Vending Machines or Mobile Vendors; Employer or School Cafeteria
5. Alcohol type (if included): wine, beer, or other
6. Alcohol cost (if included)

### **II. Food and Drinks for Home Consumption**

1. Description of what was purchased
2. Total cost *without tax*
3. Whether the purchase was for someone outside of the household
4. Packaging: fresh, frozen, bottled/canned, or other

### **III. Clothing, Shoes, Jewelry, and Accessories**

1. Description of what was purchased
2. Total cost *without tax*
3. Whether the purchase was for someone outside of the household
4. Whether the item was for a male or female
5. Was the item for someone under age 2, 2-15, or 16 and over

### **IV. All Other Products, Services, and Expenses**

1. Description of what was purchased
2. Total cost *without tax*
3. Whether the purchase was for someone outside of the household

# Sample Expenditure Entries

Day 7		SUN	MON	TUE	WED	THU	FRI	SAT
<b>1. Food and Drinks Away from Home</b>								
Examples: breakfast buffet, carry-out lunch, dinner & cocktails at restaurant, pizza delivery, Chinese takeout, child's school lunch, bear at happy hour, beards at eatery, wine at tavern, croissant from café, ice cream from truck, wedding reception caterer, soda from vending machine, hot dog from convenience store, popcorn & soda at movie.								
Please unfold the LEFT FLAP to see Additional Examples								
Mark (X) one that best describes the type of meal:	Mark (X) one that best describes where you made this purchase:	Fast-Food Take-out Delivery Concession		Full Service Place	Vending Machine or Machine Vendon	Employer or School Cafeteria	# of alcoholic beverages (not soft drinks) purchased for someone not on your list	
Breakfast Lunch Dinner Alcohol	Description (see examples above and on the flap)					Total Cost with tax & tip	Enter the total cost of the alcohol	
101	X							
102	X							
103	X							
104	X							
105	X							
106								
107								
108								
109								
110								
111								
112								
113								
114								
115								
116								
117								
118								
119								
120								
121								
122								
If there are not enough lines in this part, please continue recording your expenses on pages 35-37.								

Day 2		SUN	MON	TUE	WED	THU	FRI	SAT
<b>2. Food and Drinks for Home Consumption</b>								
Examples: eggs, whole milk, sugar, cereal, white bread, cooking oil, tea, cola, ground coffee, beer, liquor, changes, apple juice, tomato juice, carbonated water, ground beef, bacon, lettuce, chicken parts, whole chicken, baby food, fish, shellfish, pet food.								
Please unfold the RIGHT FLAP to see Frequently Asked Questions								
What did you buy or pay for? (see examples above and on the flap)		In this item: Mark (X) one				Total Cost without tax		Mark (X) if purchased for someone not on your list
		fresh	frozen	beverage (boxed)	other			
201	WINE - 12 @ \$10.99 each			X		131.88		
202	WINE - 12 @ \$8.25 each			X		98.88		
203	CRACKERS	X				7.39		
204	FLAT BREAD + CHEESE	X				11.87		
205	COOKIES	X				15.98		
206	CAKES - 2 @ \$11.44 each	X				22.88		
207	BROCCOLI	X				7.29		
208	SALMON FILET	X				22.00		
209	SALMON SLICES	X				9.99		
210	CRACKERS	X				6.79		
211	CRANBERRY GOAT CHEESE	X				6.59		
212	MIXED DRY FRUITS	X				6.79		
213	BLUEBERRIES	X				9.49		
214	CHICKEN	X				15.97		
215	HALF/HALF CREAM	X				2.79		
216	CHEESE SPREAD	X				9.89		
217	CEREAL	X				6.59		
218	CRANBERRY JUICE	X				4.99		
219	CHOCOLATES	X				8.00		
220	SODAS (14-pack)	X			X	5.49		
221	CEREAL	X				7.49		
222	MILK - 1 gallon	X				4.99		
223	ORANGE JUICE - 1/2 gallon	X			X	3.49		
224	LEMONS	X				1.99		
225	ONIONS	X				2.41		
If there are not enough lines in this part, please continue recording your expenses on pages 38-41.								

Day 6		SUN	MON	TUE	WED	THU	FRI	SAT
<b>3. Clothing, Shoes, Jewelry, and Accessories</b>								
Examples: shirt, sweater, shorts, suit, dress, sandals, sneakers, soccer cleats, team uniform, soccer cleats, gloves, slippers, dance costume, watch, necklace, belt, pajamas, engine, sport, coat, jacket, windbreaker.								
Please unfold the LEFT FLAP to see Additional Examples								
What did you buy or pay for? (see examples above and on the flap)		Total Cost without tax		Was the item for:		Age		Mark (X) if purchased for someone not on your list
				male	female	12-19	20-29	
301	pants							
302	sweatshirt							
303								
304								
305								
306								
307								
308								
309								
310								
311								
312								
313								
314								
315								
316								
317								
318								
319								
320								
321								
322								
323								
324								
325								
If there are not enough lines in this part, please continue recording your expenses on pages 41-42.								

Day 3		SUN	MON	TUE	WED	THU	FRI	SAT
<b>4. All Other Products, Services, and Expenses</b>								
Examples: cigarettes, gasoline, utility gas bill, prescription drugs, cordless telephone, dry clean (outlets), movie tickets, DVD rental, bus fare, phone bill, car insurance, brake work, hand soap, dish soap, power tools, paper towels, bath towel, rent, textbooks, cook-book, airline fares, computer cables, cable, TV set, color television.								
Please unfold the RIGHT FLAP to see Frequently Asked Questions								
What did you buy or pay for? (see examples above and on the flap)		Total Cost without tax				Mark (X) if purchased for someone not on your list		
401	ELECTRIC BILL							398.90
402	WEED POISON - 3 gallon							27.97
403	2012 CALENDARS - 2 @ 88¢							1.76
404	PLASTIC PARTY TOOTH PICKS							6.78
405	RENEWAL FEE - DISCOUNT CARD							9.99
406								
407								
408								
409								
410								
411								
412								
413								
414								
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420								
421								
422								
423								
424								
425								
If there are not enough lines in this part, please continue recording your expenses on pages 43-44.								

## Evaluation of the “Diary Keeping” Experience

1. Of your household’s total expenses for the week, about how much do you think you actually recorded using the app?  
None \_\_\_ 10% \_\_\_ 25% \_\_\_ 50% \_\_\_ 75% \_\_\_ 90% \_\_\_ 100% \_\_\_
2. When did you enter your expenses?  
\_\_\_ a. Immediately after the purchase  
\_\_\_ b. At the end of each day  
\_\_\_ c. Every few days  
\_\_\_ d. At the end of the week
3. How did you obtain expenditure information from other household members?  
\_\_\_ a. N/A (I am in a single member household)  
\_\_\_ b. I didn’t  
\_\_\_ c. I asked them and then entered the expenses myself  
\_\_\_ d. They entered the expenses into the app themselves  
\_\_\_ e. Other, specify
4. Approximately how much time did you spend using the app?  
\_\_\_ minutes
5. Outside of this study, if you were asked to use a smartphone app custom designed to collect CE data to record your household’s expenses, would you be willing to participate?  
\_\_\_ a. Yes  
\_\_\_ b. No
6. If given a choice between recording your household’s expenses using a custom designed app on your smartphone or a paper diary, which would you prefer?  
\_\_\_ a. A smartphone app  
\_\_\_ d. A paper diary
7. What did you LIKE about using a smartphone app to record your household’s expenses?
8. What did you NOT LIKE about using a smartphone app to record your household’s expenses?
9. If you did not like using the smartphone app, is there anything that could be done differently to persuade you to use the app to enter your expenses?

## Evaluation of the Smartphone App

10. What were your general impressions of the app?
  
11. What features did you like?
  
12. What features did you NOT like?
  
13. Did the app allow you to make any customizations (e.g. adding or deleting categories/subcategories, adding personal information such as household member names) and if so, did you make any customized changes?
  
14. Did you enter in all the required detailed information from page 4 (e.g. alcohol costs for meals away from home, packaging type for grocery items, age and sex for clothing purchases) and if so, how did you do it?
  
15. What problems did you experience entering your information into the app?
  
16. If CE was to design an app to collect CE Diary Data, what features should it include? (e.g. a camera to take a photo of a receipt)
  
17. If CE was to use a smartphone app to collect CE Data what procedures would be best suited for respondents (e.g. having individual household members use their own smartphones)

## General comments about your app experience

## APPENDIX C. Compilation of Individual Evaluations

### 1. Of your household's total expenses for the week, about how much do you think you actually recorded using the app?

	N
None	0
10%	4*
25%	2
50%	1
75%	5
90%	8
100%	0

\*1 of the participants who responded 10% only did so because the app they used only allowed 10 entries in the free lite version.

### 2. When did you enter your expenses?

	N
Immediately after the purchase	6
At the end of each day	8
Every few days	7
At the end of the week	3

### 3. How did you obtain expenditure information from other household members?

	N
N/A (I am in a single member household)	10
I didn't	1
I asked them and then entered the expenses myself	6
They entered the expenses into the app themselves	1
Other, specify	1
Blank	1



**4. Approximately how much time did you spend using the app?**

minutes	N
10	1*
20	3
30	6
40	1
60	1
75	1
90	1
105	1
120	2
140	1
Blank	2

\*The participant who responded 10 minutes only did so because the app they used only allowed 10 entries in the free lite version.

**5. Outside of this study, if you were asked to use a smartphone app custom designed to collect CE data to record your household's expenses, would you be willing to participate?**

	N
Yes	18
No	2*

\*1 Participant said No, unless they didn't have to do as much typing

**6. If given a choice between recording your household's expenses using a custom designed app on your smartphone or a paper diary, which would you prefer?**

	N
Yes	18*
No	2

\*1 Participant said Yes, only if it synched with a computer

## 7. What did you LIKE about using a smartphone app to record your household's expenses?

App Name	
AndroMoney	If I'm eating out, buying things with friends, etc, I don't need to wait to get home to record my expenses.
Certify	Entering data was fast and fun.
Coinkeeper	It was on me all the time.
CW Money Expense Track	<ul style="list-style-type: none"> <li>• Accessibility</li> <li>• Ease of use</li> <li>• Flexibility of using it anytime after incurring the expense.</li> </ul>
Droid Wallet	I always have my phone handy, so if I want to enter an expenditure at any time I can. I also liked that the app totaled up spending for each category, so I could get the benefit of seeing how much I spend for each category each week.
EasyMoney	I always have my phone with me, so I could enter the info whenever I had time (I like doing things like this on my commute).
Expense Cloud	I did not like it. I found it too cumbersome.
Expense Manager	Electronic recording of information including supporting documentation in an organized single location.
ExpenseRec2	It was very handy to have it on my phone for "on the spot" one expense entries like a meal away from home or a snack.
Home Budget w/ Sync Lite	In general, the smartphone application made it much more efficient to record expenses immediately after purchase (or closely thereafter) than it would be with a regular paper diary. Data entry was quick and display was relatively well organized.
iXpenseit lite	The app is very well organized and easy to use. The budgeting feature and related summary reports were the best I've used on my iphone (cleanest and easiest to produce)
Money Care Lite	I had access to an easy log of what exactly I was spending money on. It made me more conscious of where money was being spent.
Money Lover	Liked the voice recognition feature, it was much easier than typing on that small keyboard.
MoneyZoom	I like that you could create as many categories and subcategories as you wanted.
Monthly Budget	Very accessible, it is always with you.
One Expense LT	
Pico Spend Lite	Since I carry my phone everywhere, it was easy to enter my expenses immediately, and be done with it. I liked the daily summaries, and the ability to export it to PDF. Use of customizable, pre-specified categories was nice, too.
ProOnGo	The cell phone camera filling in some of the data was cool. I like that it gave me instant feedback in the form of charts. It was nice to have it with me so I could plug I my lunch costs right away. Once I got some categories set up it was easier.
Spending Lite	Ease of editing expenses. Much easier than writing them down and crossing out if necessary. Plus, even though I entered my expenses at the end of the day; I can see the benefit of recording expenses immediately after purchasing items.
Xtrack	Availability and Portability

**8. What did you NOT LIKE about using a smartphone app to record your household's expenses?**

App Name	
AndroMoney	My phone is very slow, so sometimes I don't feel like opening the app to record things. I did almost every time, though.
Certify	The app would occasionally kick me out, and there was a learning curve on entering data accurately.
Coinkeeper	It is easily forgettable
CW Money Expense Track	Nothing specific
Droid Wallet	It takes a while to itemize everything bought, especially for a grocery bill.
EasyMoney	By nature of it being a smartphone, it was somewhat harder to do than the web diary.
Expense Cloud	Using the phone keys to record data.
Expense Manager	It was fun exploring the software but I was suspicious of software security and the upload of my data to the "cloud". I also did not like some of the software behaviors such as after uploading the data from one device to the "cloud" through the drop box synchronization, the data download by a second device caused all the previously entered data on the second device to be overwritten by what was downloaded. I also was not sure how data from two separate devices will be easily merged and checked for consistency and double recording, I did not see the software is doing anything in this regard.
ExpenseRec2	It was very cumbersome to use the app for entering many expenses such as weekly groceries. I also didn't like that I kept forgetting I was participating. I thought I was being smart by putting the icon in a place where I'd see it every time I used my phone, but I still forgot.
Home Budget w/ Sync Lite	Smartphone screens are tiny (and subsequently, have tiny keyboards) making extended data entry tiring / cumbersome.
iXpenseit lite	It was a little tedious to record all of your expenditures when you can simply download a copy of your bank statement listing each purchase but not all participants use debit/share check cards, nor is this problem unique to an app vs paper diary.
Money Care Lite	It is still easy to forget to record everything.
Money Lover	I am not a SmartPhone person, so I am not used to carrying a phone around and having it on all the time.
MoneyZoom	I like to use a mouse, so I prefer websites over apps. I mean, I had to go into the website first so I could figure it out anyway. Also, you can't add variables, for example who it is for or tax or alcohol included. Everything would have to be pushed into notes or there would be a LOT of subcategories that would have to be created for each item.
Monthly Budget	Forgot to log some expenses. Forgot to constantly update the info.
One Expense LT	It was easy to forget since it (the app) was not something I previously used on a regular basis, and the app was not something I saw regularly either. I had to remember to open it.
Pico Spend Lite	When there was a large number of expenses (e.g., after a trip to the grocery store), it was tedious to enter each item – would have been faster for me to use paper. Lite/Demo version didn't allow some features (e.g., looking back more than 3 days); also no easy way to add forgotten expenses for a given day.
ProOnGo	There was a lot of typing, especially for grocery receipts. Even though it was a free app, I still had to type in an e-mail address. I didn't read the terms and conditions but I have some concern that my info will be used for marketing

App Name	
Spending Lite	The categories that my app provided were way too general. I didn't like having to constantly create categories. For example, I created medical, specific fruits from the grocery store, etc
Xtrack	Can't sync to my desktop

**9. If you did not like using the smartphone app, is there anything that could be done differently to persuade you to use the app to enter your expenses?**

App Name	
AndroMoney	No, I liked it.
Certify	The app should provide an easy way to categorize items, including meal type, for whom the purchase was made, and the age of that person.
Coinkeeper	
CW Money Expense Track	I liked it
Droid Wallet	N/A
EasyMoney	
Expense Cloud	No.
Expense Manager	A specific customized application can always help making the experience much smoother.
ExpenseRec2	A barcode scanning option would have helped quite a bit on the groceries even though I would have still needed to enter the prices.
Home Budget w/ Sync Lite	Having a PC / Web application paired with the smartphone application that would allow deferral of larger or more complicated entries into a more comfortable environment would make the experience all the more robust.
iXpenseit lite	
Money Care Lite	
Money Lover	
MoneyZoom	Don't know
Monthly Budget	I liked it. I suggest that the app have a popup or reminder saying "did you purchase anything recently? Write it down!"
One Expense LT	Built-in reminders (like ones that come up for other apps).
Pico Spend Lite	Pico Spend Lite had main categories you could customize, but my data entry would have been made easier if it also had customizable, pre-specified sub-categories (e.g., types of food for home) and if text description fields had auto-spell correct and/or smart features (e.g., remembering and learning from previous entries).
ProOnGo	It would be great if the app shared an interface with either a desktop program or website. Typing on the little keyboard was tedious.
Spending Lite	Overall, I liked the smartphone app compared to the paper diary, but it would be beneficial to have one that is set up with CE's diary categories already provided.
Xtrack	

## 10. What were your general impressions of the app?

App Name	
AndroMoney	Simple, very easy to use
Certify	It was easy to use and enjoyable.
Coinkeeper	It is a budget tracking app. Not easy to enter expenses. Have to create everything. It's not intuitive.
CW Money Expense Track	There wasn't any at the beginning. After using it though, I would recommend it to everyone
Droid Wallet	The app was a good start, but would not suit the needs of CE.
EasyMoney	Generally very easy to use. It was pretty intuitive and didn't take much to pick it up and start using without having to read instructions.
Expense Cloud	Didn't like it.
Expense Manager	The application is to help manage expenses through budgeting. It allows user to set up accounts and categories of spending. The application has many bells and whistles that are not needed for the CE survey purposes.
ExpenseRec2	It was ok. I thought this app required too much manual entry when I know that barcode scanner technology is readily available in apps.
Home Budget w/ Sync Lite	In general, the application was relatively well thought out but seemingly attempted to put aesthetic design over functionality in a number of cases. It was simple enough to add data once the proper settings and buttons were uncovered (not that this was a difficult task itself, but at least one that stood out in memory).  I have no basis to compare my experiences against, however.
iXpenseit lite	In general, I understand why the app is so highly rated in the app store, It is very well laid out, user-friendly, and I even thought that the budget summary reporting could be very useful.
Money Care Lite	It was easy to use. But there are some quirks in the design. It felt like it was originally designed by someone for their own who then decided to try and sell it. It was hard to get a full impression of the app since some features seemed to be disabled in the free version.
Money Lover	Pretty quick and user friendly.
MoneyZoom	Very clean format. Has reminders that you can set – daily or weekly.
Monthly Budget	It is a very good app. I like it a lot. I just need to be more mindful of updating it.
One Expense LT	Meh. It was clearly built toward cash flow. The types of items purchased seemed like secondary information.
Pico Spend Lite	The app is pretty nice. The interface is simple and intuitive – there are four basic menus (new expense, daily expense summary, longer summaries/comparisons, and general/admin), and the data entry keys/functions are accessible/usable. There is not a big learning curve.
ProOnGo	It was good. It took a lot of work up front but got easier once I had entered categories and vendors I could reuse. There was a small learning curve as well.
Spending Lite	It was pretty easy to operate. It provided the amount you have spent. Even though, I didn't like constantly adding categories, it was pretty easy to do so.
Xtrack	I can work while the family is shopping and instead of getting bored or rushing my wife and children I sit outside the shop collect the receipts enter the figures do the math once the limit is reached, I text my wife to shop to meet where am sitting in the mall, If I don't a response I block the accounts.

## 11. What features did you like?

App Name	
AndroMoney	You can be as specific as you like when entering things, since you can make your own category for the expenditure.
Certify	Data entry was fast and easy once I got accustomed to the phone. Electronic record keeping makes using the Data easier, there's no keying involved and no handwriting to try and puzzle out.
Coinkeeper	
CW Money Expense Track	Visualization/summary of the expenses that I wouldn't realize otherwise. Generally this sort of report is sent by the credit card companies at the end of a financial year. Here you have the option to see it anytime.
Droid Wallet	I liked that I was able to enter a budget, and then see if my expenditures were within budget. I also liked that the app totaled up my spending for each category.
EasyMoney	Ease of use. The ability to categorize whether something was credit card or cash was a nice feature.
Expense Cloud	None.
Expense Manager	Taking photos of expense records and receipts but it could be functioning better.  Adding main expense category and a second layer of subcategory but it could be made better by allowing more than just a second layer of subcategories.  Showing totals and subtotals by expense categories.
ExpenseRec2	Nothing in particular. The app was just ok.
Home Budget w/ Sync Lite	Organization and presentation of expenditures was a nice touch. The application seemed overall well thought out. Integration with the camera's phone worked well.
iXpenseit lite	Recording expenses and income is extremely easy and with few exceptions covers all pertinent information that I would like to incorporate and record in my budget. Of course, this does not mean that the app records all information pertinent to CE Diary, but you can record this information in "notes" etc.
Money Care Lite	Running list of transactions on the first screen. Graphical breakdown of where money is spent by category.
Money Lover	Voice recognition
MoneyZoom	Like adding the categories.
Monthly Budget	I liked how it allowed you to add/update categories and add/update budgets. The bills feature is also extremely helpful.
One Expense LT	It was relatively easy to "add" an expense – push a button and then type in the amount on a calculator.
Pico Spend Lite	<ul style="list-style-type: none"> <li>• I liked that the app has a customizable set of pre-specified expense categories, and that these are easy to access through a scrolling menu display.</li> <li>• The summary reports (daily and longer) are nice, though on the Lite version you can only go back over the last three days.</li> <li>• I like that it gives you the option to export to/view in PDF, though it's unclear how you would send the PDF to another app or someone else.</li> <li>• The edit feature available directly on the report/review screen is nice – you can easily change the description, amount, and date of purchases.</li> <li>• The Help items were informative and not overwhelming.</li> </ul>

ProOnGo	The ability to read date, vendor, and total cost from receipts was pretty amazing though it did take awhile. The tax function was helpful for making sure that when I broke down transactions into individual items the total came out of what was on the receipt. The tax function didn't work properly in the app but I'm not sure if that is because it's the free version or not.
Spending Lite	Ease of adding expenditures. Has a spending history feature to track your expenses. It offers a recurring transactions feature for monthly expenses.
Xtrack	The interface it has all the categories that suite my life style including the children's features and subsections with the ability to customize

## 12. What features did you NOT like?

App Name	
AndroMoney	Some of the graphics look a little cheap, blurry. I wish there was a better calendar view. When I click "month" or "week", it only shows my expenditures as a large list.
Certify	<ul style="list-style-type: none"> <li>• -Occasionally the app would go back 1 screen and I would lose the data just entered.</li> <li>• -Sometimes the app did not advance to the next line when I hit enter.</li> <li>• -If I made a spelling mistake it seemed too much work to erase and correct my answer.</li> <li>• -The app did not fill in a leading zero; a fifty cent item had to be typed in as "0.5, " not just ".5"</li> </ul>
Coinkeeper	You have to create accounts and categories in order to enter any information. You cannot enter information until you build your categories.
CW Money Expense Track	Nothing specific during the time used. There could be chances of finding issues if more time is spent using it.
Droid Wallet	I wished I could have created my own categories, instead of entering information, such as food away and food at home.
EasyMoney	Having to manually enter everything was a pain. I'm glad I didn't make too many expenditures throughout the trial week.
Expense Cloud	All
Expense Manager	<p>Having to type in all the items and their detailed information.</p> <p>Even with customizations like creating expense accounts and categories, the application is unable to easily capture the kinds of details the CE survey is asking for. I ended up utilizing the expense description field to squeeze the information in.</p> <p>Application did not allow the use of comma in the name of the expense categories, spaces instead of the commas worked though.</p> <p>When I initially started setting up the categories based on the four categories in the CE Diary survey, I tried creating a separate expense account for each category. The application ended up with creating separate expense account categories for each of the following (simply it took the comma in the expense category name and treated it like a separator of a category and created this many accounts): Clothing, Shoes, Jewelry, and accessories. I ended up with 4 accounts for the above CE survey category. I guess this is an intended feature of the software if it is used properly.</p>

App Name	
ExpenseRec2	The manual entry.
Home Budget w/ Sync Lite	Buttons to navigate through options or even add new expenditures were quite small and tucked in the corner. Such major activities should have been far easier to access.
iXpenseit lite	The "vendor" category is too specific as it requires you to write out the exact vendor (McDonald's etc.) that you purchased from. I believe you should have the option of recording the exact vendor if you choose, however, in general it would be better to just select which category it is.
Money Care Lite	<p>Requiring „notes“ to be entered everytime. When you enter a note that was used before, all of the information from the previous transaction that used that note comes forward, overwriting what you might have entered. It was not clear that you should enter the note first. It seemed that notes were some time of ad hoc category and categories are really sub categories.</p> <p>Also it is not clear how to switch from month to month. It looks like you can press the arrows on either side of the month, but that does nothing. You have to swipe in the middle on the screen.</p>
Money Lover	Small keyboard for typing. Made a few typing mistakes especially when typing the “.” which is right next to the “done” key.
MoneyZoom	<p>I like to use a mouse, so I prefer websites over apps. I mean, I had to go into the website first so I could figure it out anyway. Also, you can’t add variables, for example who it is for or tax or alcohol included. Everything would have to be pushed into notes or there would be a LOT of subcategories that would have to be created for each item.No help menu (!?!), no contact info, and is based in Poland.</p> <p>*might look fishy to some participants.</p>
Monthly Budget	N/A
One Expense LT	<p>From a CE perspective, I don’t like seeing the „income“ option since we aren’t really interested in their cash flow.</p> <p>Also, I originally downloaded the app to my iPad, but then it was later automatically downloaded to my iPod. In hindsight, it would be awesome for it to have also automatically downloaded the data from the iPad as well so that the two were consistent.</p> <p>Finally, the converse of #11 above – you could just enter an expense amount and hit save. It did not require any description or categorization for the expense.</p>



App Name	
Pico Spend Lite	<ul style="list-style-type: none"> <li>• The screen did not re-orient – it was only available in „portrait“ mode, but sometimes I like to do text entry from the wider/landscape position.</li> <li>• There was a 25 character limit in the text entry description field; often I needed to have more than 25 to capture necessary attributes of the expense.</li> <li>• On the report screen, the text description often overlapped with the dollar amount (since text descriptions often had to be long), making it difficult to see dollar amounts.</li> <li>• Text entry didn’t auto-correct/suggest spelling, and did not remember past entries so I had to retype things over and over for recurring purchases or purchases of similar items.</li> <li>• It would have been easier if the app had sub-categories, not only the main categories.</li> <li>• App doesn’t sub-total expenditure amounts by category, only gives the percent of total expenses that was spent in the category over a specified time period.</li> <li>• No way to change the date of purchase in „new expense“ entry screen. You can edit date from the „report“ screen, but this is an extra step and was tedious when I had to enter a number of items purchased on a previous day.</li> <li>• There was no (obvious) way to share the app with other HH members (e.g., so my wife and I could both have it on our phones, and make our own entries on an integrated account).</li> </ul>
ProOnGo	The app is mainly set up for transactions but does handle individual items. At the outset, the app wasn’t set up in the way I needed so I had to type in Categories I wanted, each vendor I visited, etc. Things got easier when I could reuse categories. The program had a lot of bugs. It would erase info I had typed in This would have to be fixed in a CE instrument because I was almost frustrated enough to quit.
Spending Lite	Limited categories. Had to add many categories to match the paper diary.
Xtrack	The scroll, select and click feature category to enter my expenses so I didn’t have to re-label or create a new subtitle

**13. Did the app allow you to make any customizations (e.g. adding or deleting categories/subcategories, adding personal information such as household member names) and if so, did you make any customized changes?**

App Name	
AndroMoney	Yes, I did. I bought some wine, and realized there was no “alcohol” category, like there usually is on the real CE.
Certify	No
Coinkeeper	You had to add everything. No categories exist until they are added.
CW Money Expense Track	yes. Added „Transportation“ as a category and „Public“ as sub.
Droid Wallet	No, no customizations were possible.
EasyMoney	Yes – The categories available were not detailed enough for what is used in CE, so in order to get into the specificity that CE would need, I had to create new categories. I gave up doing this after the first several because it was too time consuming to create the additional categories.
Expense Cloud	If it did, I didn't figure it out

Expense Manager	Yes, I added new categories and subcategories to mimic the CE Diary survey as much as possible. I had to use the description field to include the expense details. The application did not allow adding more than two layers of a category and its subcategories. The software did not allow adding household member information. I tried creating subcategories by each of the possible scenarios of each CE expense categories as a compromise instead of entering the expense details in the description field. For example under the clothing category, I tried to create two sub categories for inside CU and outside CU so later I could add male and female subcategories under each as a third layer subcategory and then adding the age group subcategories. I could not set this up as the application is limited to only a second layer of subcategories.
ExpenseRec2	The categories were acceptable to me so I didn't make any changes to that. I used the Memo section to enter my specific descriptions.
Home Budget w/ Sync Lite	Yes, I made categories to match the Diary categories
iXpenseit lite	Some. For example, some of the useful customization features that I used were defaults which allowed me to set default accounts (Personal vs. business) expense category and subcategory. This did help save time in recording expenses. You can also customize a reminder to record expenses daily.
Money Care Lite	Yes it lets you setup categories.
Money Lover	Yes, I added a category for Food Away from home, separate from Food.
MoneyZoom	Yes. I could make some of the changes to match the diaries categories (but not all of them). Please see next page.
Monthly Budget	Yes, I added a category for toiletries
One Expense LT	It did allow adding/deleting categories, but not subcategories within categories. It also allowed adding/deleting different "accounts" (the defaults were ,corporate" and ,personal") and payment types (defaults were ,cash" and ,credit card"). So, I guess you could set up the ,accounts" as different household members.  I, however, did not add any categories to my entries.
Pico Spend Lite	Yes, the app comes with 15 – 20 pre-specified categories and it is easy to delete those you don't want, edit existing categories, or add your own. I did this to conform to main CE categories (e.g., "Food Away from Home," "Food/Drinks for Home"). The app did not have any customization for HH member or other tailored information
ProOnGo	
Spending Lite	Yes, I added categories.
Xtrack	Yes it I didn't have to make any but if I did I could

**14. Did you enter in all the required detailed information from page 4 (e.g. alcohol costs for meals away from home, packaging type for grocery items, age and sex for clothing purchases) and if so, how did you do it?**

App Name	
AndroMoney	No, there was room for notes, but I didn't feel the need to write anything. I probably should have :). I tried to describe my purchases as accurately as possible via the categories.

Certify	<ul style="list-style-type: none"> <li>• -For Alcohol yes, for grocery packing type not always, clothing gender yes.</li> <li>• -It does raise questions about how we collect the data. For example is age not necessary since everyone in my CU is over 18? Should the alcohol bill be included in the restaurant total and then also reported separately? One category was unclear – is a “church carwash \$25” considered a charitable contribution?</li> </ul>
Coinkeeper	No you cannot enter that information except as a note.
CW Money Expense Track	No
Droid Wallet	Yes, I just wrote in those details for the notes.
EasyMoney	(see above answer)
Expense Cloud	Yes
Expense Manager	<p>See response under #13 above please. This was a pain to type all of the details in the description field. I do not know how useful this detailed information will be under the description.</p> <p>It was not clear how to enter the expense information for each member in one device. Probably setting up a separate expense account for each member might work.</p>
ExpenseRec2	I started to enter the packaging types for food at home but I gave up after a while because it was taking too long. For food away I put the location but not the meal. I did really realize that until just now.
Home Budget w/ Sync Lite	Yes, a (limited) notes section was added to provide such detailed information
iXpenseit lite	I did enter some detailed information for example, alcohol costs, but I did that in "notes". This does not break down the cost of food vs. alcohol. The app does not allow even a breakdown for groceries purchased, much less a feature to record package type.
Money Care Lite	No the app does not provide a way to record that level of detail in a structured manner.
Money Lover	Generally I forgot about it.
MoneyZoom	<p>Kathy’s Notes: The application has the following variables. I couldn’t tell how to add variables (Plus there is no help menu or manual online.) You can add categories and subcategory for the “category” of expense. The category is not check all that apply, so you would have to put some data in the „notes“ which is so messy.</p> <ol style="list-style-type: none"> <li>1. Category/subcategory</li> <li>2. Amount</li> <li>3. Date</li> <li>4. Vendor (editable list)</li> <li>5. Payment form</li> <li>6. notes</li> </ol>
Monthly Budget	Yes, Just used the expense entries option on the app. Any additional info that I had I just put in the "notes" section. It allowed me to be more specific about the purchase.
One Expense LT	Not really. I entered item descriptions that were sufficient in identifying the items, but I didn’t specifically mention packaging types for grocery items. For instance, some of the grocery item descriptions I entered were “baby carrots,” “skyr,” “cream,” and “ice cream.” The first three are only commonly sold as fresh items, so it seems to me that the descriptions were sufficient without adding “fresh.” Similarly, with ice cream.
Pico Spend Lite	Yes, I made an effort to try to capture the level of detailed required by CED, but occasionally - due to character length restrictions in the Descriptions/Notes field – I could not. I had to type out everything except the major category label.

ProOnGo	
Spending Lite	No. Age and Sex for clothes were not available and also packaging type.
Xtrack	Yes , I could do subtitles for myself, my wife, 1 boy and 2 girls their ages ,sex and how much we sent as a family for books, clothing, toys, shoes, socks, and grocery, do our predictive analysis of how much money we need to run the family now and the future.

### 15. What problems did you experience entering your information into the app?

App Name	
AndroMoney	“Books” weren’t where I thought they would be. I feel like the “entertainment” and “publications” categories could be merged.
Certify	<ul style="list-style-type: none"> <li>• -Sometimes the app would not capture the description and would kick me out of the app entirely.</li> <li>• -There was no uniform way to enter all the required categories, especially since there is a different level of detail for different groups: food = no tax, restaurant meals include tax, age, sex, and gift status required for apparel.</li> <li>• -According to my receipt from the store, I spent \$1.75 on”ss clsc vizz” . I had no idea what that was, and still don’t. I gave up and just typed in the cryptic description. “Stainless Steel Classic Vizene” was not in my shopping basket.</li> </ul>
Coinkeeper	It was not intuitive. No real directions,. Easy enough for simple things like "dinner at taco bell" . Don't want to have to enter grocery bill.
CW Money Expense Track	Nothing specific. It takes time to get started and be familiarized with the categories. After that, it’s pretty quick to add the data.
Droid Wallet	It was cumbersome to enter all the required data into the notes section. It would be nice if there were checkable buttons (or something along those lines) for the extra detailed needed.
EasyMoney	None. It was easy to download, install, and get started.
Expense Cloud	Typed wrong keys too many times.
Expense Manager	<p>Setting up expense categories to mimic the CE categories with the required details.</p> <p>Merging data from two separate devices was a problem, after uploading the information from one device to the cloud and downloading the data back to the second device overwrote the information in the second device completely. This process was not managed well.</p> <p>When taking photos of expense receipts, the photo was not readable. The telephone camera was to be set on text mode before taking the photo manually for each photo; this was not convenient for the user. The application should automatically detect the text and set the camera setting on text through the application.</p>
ExpenseRec2	None really. The app was easy to use.
Home Budget w/ Sync Lite	<p>Data input, in general, was cumbersome. While the presentation was clean, it was initially difficult to even press the buttons to add an entry or accept changes – mainly because they were tucked away into a far corner of the display.</p> <p>The layout of the actual interface to input data also left something to be desired; it was done in a style emulating a calculator – fine for most things – but managed to not have an obvious way of committing the values back to the forms.</p>

iXpenseit lite	With this app, you cannot (easily) record alcohol type and cost, snack under meal type, style of vendor (app records specific vendor, i.e. starbucks), whether purchase was for someone outside of household, male or female, or their age. All of this information would need to be recorded as a note.
Money Care Lite	See question 12.
Money Lover	Typing the amount
MoneyZoom	Kathy's Notes: The application has the following variables. I couldn't tell how to add variables (Plus there is no help menu or manual online.) You can add categories and subcategory for the "category" of expense. The category is not check all that apply, so you would have to put some data in the „notes“ which is so messy. 1. Category/subcategory 2. Amount 3. Date 4. Vendor (editable list) 5. Payment form 6. notes
Monthly Budget	Sometimes, when editing an expense, even though I changed the category, it defaulted back to what was originally inputed. I had to do it twice for it to go through.
One Expense LT	The aforementioned 8 item limit. So, I couldn't really test it beyond the first 8 I entered without deleting previously entered stuff. I found it odd that the app had only four default categories listed (Car, Household, Shopping, and Travel), and I forgot to add ones that would be more pertinent.
Pico Spend Lite	On the first day, I encountered an error message that I didn't comprehend – something to the effect of „Cocoa error 15“ – it didn't make sense, but did occur when I was trying to enter in and then edit soda purchases. The error initially prevented the app from saving any new entries. I simply quit the app and re-entered it, and never saw the error message again. Other than that, there were no problems.
ProOnGo	
Spending Lite	No major problems. Adding expenses were pretty easy.
Xtrack	Tinny interface keys to navigate the interface menu

**16. If CE was to design an app to collect CE Diary Data, what features should it include? (e.g. a camera to take a photo of a receipt)**

App Name	
AndroMoney	Notes section, automatic sales tax calculator (eg, you've already entered your local sales tax rate, like 6%, for items that were taxed, check a certain box, enter a product's original price, like \$5.99, and it adds the tax for you), a barcode scanner perhaps.
Certify	A way to select the correct category would help (food at home, restaurant, apparel, etc) since the required level of detail varies.
Coinkeeper	Camera functionality. Barcode scanner.
CW Money Expense Track	<ul style="list-style-type: none"> <li>• Voice command where the app can prompt the user to speak the amount instead of typing. Same can be used for selecting the categories and subcategories.</li> <li>• Camera/ barcode scanner (as mentioned)</li> </ul>

Droid Wallet	Camera functionality to take a photo would be great.
EasyMoney	<ul style="list-style-type: none"> <li>• Voice recognition – instead of having to type, it would be easy to just say what was purchased and for how much.</li> <li>• The ability to enter information via the smartphone OR via the web. If I'm by a computer, I'd want to use the computer. If I'm out, I want to use a smartphone. It would be good to be able to do both and then have them always synced.</li> <li>• There are some feature in another smart phone apps that I use (a calorie counting app) that I find useful and could probably be used for tracking expenditures too: <ul style="list-style-type: none"> <li>o The ability to select recent expenditures (one or many) made and add them again, with the ability to edit aspect of them if necessary like total amount paid or date of expenditure. This would be useful if making the same type of expenditure fairly regularly like lunch in the cafeteria)</li> </ul> </li> </ul>
Expense Cloud	Yes, take a photo of the receipt so I don't have to type in. Let me voice record my expense.
Expense Manager	<p>Expense categorization and details of expense capturing through a good mechanism other than through the description field. Perhaps allowing to enter more than two layers of subcategories will help in this area.</p> <p>Taking the photo of the receipt is a good feature if it is designed to be done with no burden such as setting the phone on the text mode by the user manually for each photo.</p> <p>It might help with application performance if the data is written directly to the SD Card instead of memory but security of the data can be compromised with no locking mechanism such as password on the SD Card. Someone can take the card out and access the data directly.</p> <p>Also, having the application free of background running services as much as possible will help with application and phone performance as well. For example, even if there is a service running to look for the latest version upgrade or messages from the vendor, there should be an option within the application where the user can choose to disable running such a service if he/she not interested in these updates or messages to help boost the phone's performance and response time.</p> <p>Allowing features such as data consolidation among CU members and automatic checking to avoid data entry duplication by different CU members i.e. husband and wife both entering the mortgage payment for the month.</p>
ExpenseRec2	Include a barcode reader, maybe voice recognition, and more canned selections rather than many open ended text fields. The ability to automatically set reminders to make entries would be a great option as well.
Home Budget w/ Sync Lite	I did enjoy the photo-of-receipt option, but I would take it further. It would be nice to be have the application parse the text on the receipt to automatically pull in at least some of the information.
iXpenseit lite	I think the basic outline used by this app (list of income/expenses separated by category) would work very well. Of course, it would need to be tailored a bit to fit all CE needs. As well, I am a big proponent of keeping a budgeting feature as compensation. people will then have a reason to accurately record expenses.
Money Care Lite	Some kind of mechanism to help you remember to use it, I was good at first about using it, but towards the end of the week, had trouble remembering to use it.
Money Lover	The user should have three options for data entry: voice recognition, receipt scanning, and manual entry.

MoneyZoom	Just one that captures all of the data elements we need – like whether it was for a person outside the house, or gender for clothing. That would be enough to make me happy.
Monthly Budget	Photo of the receipt would be the main thing. Also, being able to speak to the app and it should determine the expense (talk to create an expense)
One Expense LT	<p>Sure, accessing the camera for taking photos of a receipt would be great. But as a respondent, I would consider my work done if I took a photo of a receipt. There are image readers out there that can read a receipt, so accessing the camera of a smart phone should be thought of in conjunction with that.</p> <p>The process for entering any expenses should be relatively straight forward. I like that you just entered the expense amount first on this. It seems like that is the most pertinent info in people’s minds, but then there would also have to be error messages/prompts to ensure the other applicable data is collected.</p> <p>The respondent shouldn’t have to do any setup (i.e., like adding categories) beyond personalizing it to suit their tastes.</p>
Pico Spend Lite	<ul style="list-style-type: none"> <li>• It should provide both customizable categories/sub-category labels, as well as the ability to type descriptions for the individual items. Ideally, the description field would have some „smart“ features to ease respondent burden (e.g., spell-check/auto-suggest; perhaps speech-to-text).</li> <li>• It should provide some added value to users – like the summary reports, charts, ability to share/export portable versions of the summaries, etc.</li> <li>• In principle, I like the idea of incorporating a photo/receipt-capture feature, but caution that users may over-rely on it – e.g., take a picture rather than enter detailed information. So, the digital capture would need to be sufficiently sophisticated – i.e., either automatically extract necessary information OR be integrated into the data entry feature in such a way as to ease respondent burden (e.g., through OCR; having receipt available on a portion of the data entry screen to prompt recall; etc.).</li> <li>• Maybe it is just me, but at times I wished that the app had a reminder system – a prompt or series of customizable prompts that asked me if I had any expenses to enter, or if I needed to check with my wife, etc.</li> <li>• There should be an easy way for respondents to enter in the date of purchase – the default on Pico Spend was to record all expenses as „today’s expenses.“</li> <li>• A user-friendly “help” system. Pico Spend had links to clear step-by-step graphics (with screen shot examples), as well as to video (youtube) demonstrations. Perhaps even an easy way to email/text questions (and get a timely response from FR!) within the system (e.g., “You have one response/message in your inbox.”)</li> </ul>
ProOnGo	Definitely a camera to take pictures of the receipt and fill in a good deal of the information. The ability to sync across platforms so I can photograph the receipt on the phone but then use my computer to type in supplemental information. It should definitely give feedback to the user in the form of graphs, charts, and tables this would be an added incentive for respondents to use it.
Spending Lite	Categories to match the paper diary. Options such as age and sex for clothing. Definitely a camera for receipt photos.

Xtrack	<p>Speech recognition like Siri in the iPhone4s</p> <p>Name of child xxx  \$4.99 socks  \$14.99 dress  At Name of store GAPP  Add total  Total = \$19.98  Then you can ask Siri how much did I spend on specified child Name on a specific date e.t.c</p>
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**17. If CE was to use a smartphone app to collect CE Data what procedures would be best suited for respondents (e.g. having individual household members use their own smartphones)**

App Name	
AndroMoney	For all smarphone-carrying household members, it makes sense for them to use the apps themselves. In houses with a limited number of smartphones, each sans-smartphone carrier should have a designated smarphone carrier accounting for their purchases.
Certify	<ul style="list-style-type: none"> <li>• -Yes, having individual members use their own phone would be more thorough.</li> <li>• -Get rid of every unnecessary question on an app.</li> </ul>
Coinkeeper	All members who can should have access to app.
CW Money Expense Track	<ul style="list-style-type: none"> <li>• Create an account* for the household where each user (household member) is registered to enter the expenses/incomes etc.</li> <li>• Have individual household members use their own smartphones.</li> <li>• Evert individual entry should be synced with the overall account* and users should be able to view individual and/or consolidated household level data</li> <li>• With many users within a given household, ability to edit/update data entries can be given to one individual (admin).</li> </ul>
Droid Wallet	Having individual members use their own smartphones would help track expenditures better. Also, possibly have a "notification" pop up each day if the respondent hasn't entered any data for that day.
EasyMoney	I was in a single household, so I could only speculate on this one (so I'll refrain!)
Expense Cloud	Individuals using own smartphones.
Expense Manager	Individual members entering their data makes it easier on the head of the household but checking for the data consistency, eliminating duplication and final data merging are function the application should be able to perform automatically and reliably without causing frustrations to the user.
ExpenseRec2	I think a smartphone app should only be used in conjunction with a Web diary or a paper diary. The app was really convenient for on the spot single entries but very burdensome for entering many expenses at once. I'd rather have a keyboard option for typing in a long list of purchases. In any case I really feel like we need to create something on paper that a respondent can have sitting out as a reminder of participation even if no data are collected on paper.



Home Budget w/ Sync Lite	This is difficult to touch on given the limited scope of my usage. At the bare minimum, I would suggest having respondents input the data as soon as is possible after purchase.
iXpenseit lite	Honestly, I think it would work either way, having one appointed family member to account for all purchases made by the CU or having each family member record their own expenses. If I had to choose between the two options, I would lean towards the former because I do believe it would be better for one responsible adult to record all expenses than to rely on multiple individuals who may not be as diligent.
Money Care Lite	
Money Lover	This would probably only work if everyone has their own phone. So, the only way to fund something like this would be to use a "Bring Your Own Device" model where you allow people to download the app to their own phones.
MoneyZoom	having individual household members use their own smartphones sounds like a good idea.
Monthly Budget	I think the app on their own smartphones or the option to log onto a computer and enter their expenses would help as well. I think both options should be available to use in conjunction with each other.
One Expense LT	<p>Well, duh – no one would want to use someone else's phone. That's the whole point of using your own phone. But that begs the question, do you have the app data from the two (or more) phones sync over the internet? That would allow them to see what each other has entered. I suppose you could leave it up to the household in the settings – if everyone enables data sharing, then they could see each other's purchases.</p> <p>At a minimum there should be a daily reminder set for entering expenses. Allow them to set the reminder for a certain time of day or perhaps multiple times per day, but with this type of device part of the idea of using it is to take the thinking out of the question.</p> <p>In this day and age, we should be able to set up as much of it to prompt them based on what was entered. I would almost set it up as amount, description, and then category. For a lot of items, the app should be able to just ask them the proper category (Food Away, Clothing, etc.) and just have them confirm it rather than expecting them to enter it. For instance, if you enter an amount, and then enter a description of "necklace," you should be done because we can identify that as jewelry, and we don't need to know any more information. But if you enter "shirt," we could prompt them for Women's Shirt, Men's shirt, Boys' shirt, etc.</p> <p>OR, a lot of the categories should be at a detailed enough level that they don't need to enter a description. For instance, if you have a category for Cell phone bill, they could just pick that category, enter the amount, and be done.</p>

Pico Spend Lite	<ul style="list-style-type: none"> <li>• As I mentioned above, it would have been nice if my wife and I could share the burden – by having us both have access to an integrated account on our separate phones. She has a Blackberry, so the app would need to work seamlessly across platforms. Neither of us would have minded being asked to use our own phones – in fact, I don't think either of us would readily agree to carry around a second phone just for CE.</li> <li>• I believe that the emerging literature on respondent engagement (as it pertains to their continuing/active participation in smartphone surveys/data collections) suggests that there might not be much gain in the short term (i.e., if the survey lasts only a week or so). But, if we do go the route of letting respondents use their own phones, we might consider some sort of incentive system – e.g., timely entries for CE app get the respondent chits that they can „cash in“ at the end of the survey for select items, like popular apps, coupons, etc.. Not sure about this – OMB probably would not like it, and we'd need to look at the incentives/engagement literature more closely – but I felt like I spent considerable energy gathering and entering expenses for the week, and it would have been nice to get some sort of nominal but tangible „thank you“ at the end, or even perhaps half-way through if I was doing a „good job“ (however defined). The „CE app“ certainly would be one thing respondents could keep (some people might like to have the equivalent of the full version of Pico Spend; I wouldn't, but some would).</li> </ul>
ProOnGo	I would envision a system where each household member enters info on their phones and its aggregated into an online instrument. Permission levels could be set for who is allowed to access the online instrument. As I said in #7 on the previous page, I couldn't help but feel like someone was monitoring my data. This would be especially problematic for gaining participation from people who are worried the government is monitoring them. I think there should be an explicit method for "transmitting" the data to BLS rather than having it upload automatically. There should be a submit button on a separate page.
Spending Lite	I think having one smartphone for a household would work. However, having multiple smartphones would definitely be beneficial though.
Xtrack	From my own perspective I would suggest a single user on behalf of the household to input accurate data.

## 18. General comments about your app experience

App Name	
AndroMoney	
Certify	<p>I enjoyed participating. The hardest part was entering data on the phone. For the first few days I tried entering my answers using the pop-up touch keyboard on the screen. This caused a lot of typing mistakes.</p> <p>This phone had a slide-out keyboard, but the on-screen orientation of the app did not change from vertical to horizontal to match the way I was holding the phone. This was a problem, either with the app or the phone. After two or three days of struggling with the on-screen tiny touch keyboard, I decided to only use the slide out keyboard and twist my head around to view the screen sideways. Even though awkward, it was much easier to enter prices and descriptions for me to use a real keyboard.</p>

Coinkeeper	I found the app difficult to figure out. There are no built in categories. The CU would have to basically build the survey form in order to enter information. This app appears to be more of a budget tracker as oppose to an expense tracker. There is not an easy way to enter int he description.
CW Money Expense Track	
Droid Wallet	I was satisfied with my experience. Having more spending categories, and fillable buttons (eg. for frozen food, canned food, etc.) would be useful.
EasyMoney	
Expense Cloud	
Expense Manager	Both free and professional version of the software is claimed to have the same features except the professional version allows adding business expenses data in addition to personal expenses.  Commas are not accepted in the expense category name, replacing commas with spaces will work.  Entering every single item and its detailed information on the grocery list was a pain.
ExpenseRec2	As stated above, using the app to enter single expenses on the spot was convenient when I remembered I was a participant. The app was very inconvenient for making many entries at once. I think an app is best suited as supplement to a Web or paper Diary.
Home Budget w/ Sync Lite	Generally speaking, inputting large amounts of data on a smartphone does not appeal to me. It is one thing to make a quick record of a receipt, but quite another to properly document the full details of a larger purchase.  I found myself, throughout much of the experience, wishing that the entry could be done though some kind of PC or Web Interface – mainly to save my eyesight and general aggravation from the interface.
iXpenseit lite	
Money Care Lite	
Money Lover	This app was pretty good. I would recommend that we have a broader list of item categories. Also, once a category is selected, this should determine what later questions are asked (skip pattern). So, if you select Food at Home you then are prompted for the questions about package type. These also questions and the expense amount should also allow voice recognition. Or it may be easier to allow someone to enter the item and the amount in one voice commend so we get something like “Coffee \$4.25 and Bagel \$1.99” then parse out the expenses and items later.
MoneyZoom	I hate to cheat on this one, but I’d rather use the computer website rather than a smartphone app. I like to use a mouse rather than getting finger cramping from the apps. My last preference is a paper diary, though.
Monthly Budget	
One Expense LT	
Pico Spend Lite	
ProOnGo	
Spending Lite	I think the smartphone app would be a great tool for entering in Diary information since the phone is with you and you can enter expenses on the spot. I think having the app would lower recall issues. My main concern is to have the spending categories of the application match the paper diary.

Xtrack	It's portable and available to make me stay in control and connected to my data and keeps me in touch with my finances, the ability to balance work and my family life style at the same time.
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## APPENDIX D. Focus Group Script and Notes

**Thank you for volunteering - for evaluating the app as well as participating in the focus group!**

Please talk openly and freely about your experience and opinions with the study. It's especially useful for you to tell me when your opinion differs from someone else's. Give as many details and examples as possible.

### Introductions

- Name
- Experience with technology/smartphone usage
- Name of your app and in a few sentences give us a summary of your app. What are the key things you think are share worthy about it?

**The goal of this study is to learn about the experience of recording expenses using a smartphone app and to compile a list of recommendations that will be used to inform an upcoming contract with a vendor to custom design a prototype app for CE.**

**Since you have experience with CE and are knowledgeable about CE's data needs, and have now had a taste of what it might be like to record a household's expenses using an app on a smartphone, I'd like to obtain your feedback to help guide the development of the prototype.**

1. What do you generally think about using a smartphone app to collect CE data in place of a diary?  
Good idea? Bad idea?
  - Good. You have it with you all the time, can enter stuff in immediately
  - But hate typing in phone
  - Best thing since slice bread
  - While waiting for wife shopping, can enter in purchases she's already made. Very, very good.
  - Good. It should have a reminder to enter (daily)
  - Frequency of reminders – Once a day or 3 times a day. Make it customizable and can hit snooze as an option
  - Budget info is helpful. Make it useful to the respondent. Graphs, total numbers, make it something positive for them.
2. What are some of the key features the app should have?
  - Summary features. Visually appealing. Graphs, pie charts, break down (allow them to see all the vendors in each pie)
  - Would like to keep the data for self – export to excel
  - Allowing the respondent to keep the app to use for themselves
  - Camera – pic of receipt and put in a note
  - Anything that reduces typing
  - Synching with a computer interface
  - Synching with family members

- Make it easy to enter recurring items
  - Use Siri interface – voice activation/recognition
3. Just as important as it is to identify features that the app should have, it is also useful to note any features included in your app or that you can generally think of that stands out as something that should definitely be avoided?
    - Usability don't's – be very clear, good labeling
  4. How did you feel about using your own smartphone? Would you have preferred to be given one to use (would mean potentially having to carry multiple handheld devices)?
    - Use your own is better. Wouldn't want to have to put in a password for the app.
    - Would want data synched to be protected
    - Make it linkable to a bank account or credit card? Would be less typing but there might be privacy concerns
  5. What was your method for entering expenses? Did you always enter your expense right after it was incurred? At the end of the day from receipts/notes? At the end of the week using receipts/notes? At the end of the week from memory?
    - Based on bank account at the end of the week. Especially useful for catching automatic payments.
    - Only when it was convenient did I do it right away, I usually did it daily at the end of the day
    - Mixed, based on records and some without receipts from memory
    - Felt like his app did everything besides linking to accounts. He liked it a lot and spent a lot of time playing with it so entered expenses as soon as he had one or knew of one.
  6. How accurate/complete?
    - 100% since he used his bank account statement
    - Majority. Services are harder to remember. Not tangible.
    - 70% - He specified all the details need for each.
    - 75% - level of details could be put in the notes but he was unwilling to enter the details in the notes. Thinks it would be easier if there were user-friendly icons and drop down selections.
    - Automatic payments/ bills are hard to remember – there should be a prompt for that
  7. What were the easiest types of expenses to enter?
    - Food away
    - Single items at a vendor – especially with the use of a receipt extractor
  8. What were most difficult?
    - Groceries – very tedious. People wouldn't do it.
    - Spent 30 minutes entering the items on a Costco receipt
    - Services are harder to remember. Not tangible.

9. Did you experience any technical difficulties? If not, hypothetically, what would you do if you encountered technical difficulties? Would you be willing to call tech support or the Interviewer for help? Or would you just not complete the task?
- If encountered, would just give up after awhile. Don't like to talk to tech support.
  - Would figure it out – he liked his app a lot. User interface should be intuitive and not need to read a manual.
  - He would call someone.
  - Would try to figure it out and may give up after awhile, but would not call.

10. If given the choice would you prefer app or paper? Why?

- App
- App
- App only if it has a Web component
- App

11. Are there any general problems/difficulties that you can foresee that may need to be considered in using a smartphone app to collect CE data?

- Multi-member household might be messy. Should have one dedicated instead of individual apps.

There are some features that seem obviously favorable for a CE app, like having multiple options for how to enter an expense (e.g. voice conversion to text, ability to photograph a receipt), providing a calculator,

12. Now, I'd like to ask your opinion about some features that don't seem as clearly favorable.

- a. Data entry – manually fill or autofill (like google search to guess what you will enter based on a database of popular items or based on what you've entered before)
  - Pre-fill (e.g. vendor – it's repetitive to have to re-enter same Grocery store multiple times for a grocery trip)
- b. Date – manually fill, pre-fill with today's date, or select from a monthly calendar?
  - Auto-fill with today's date
  - Auto-fill as much as possible
- c. To select from multiple options (like package type or vendor type) – drop down or multiple buttons to click?
  - Click on a category and it takes you to a new page and takes you back to that page
  - Displayed clearly

13. What can we do to keep respondents engaged?

- The typing wore him down.
- Make it clear, don't leave any guesswork for respondent, can be frustrating

- Have summary statistics at end of week 1. May help incentivize for week 2. The more you enter, the better the graphs.
- Sell the fact that this might be interesting for them.
- There are different incentives for different people. How about gamification?

14. Lastly, give me one main recommendation for developing a custom app for CE

- Have a category interface → subcategory → expense → autofill for all details
- Make it easy to enter
- Walks you through multiple options: Does item have barcode? Enter manually? Voice? Pic of receipt?
- Sync with web instrument
- Show summary at end
- Budget option gives them a benefit
- Make it intuitive without having to read any instructions
- His app was awesome (iExpnseit). Just needed to add photo aspect. Likes showing categories but doesn't want too small or too cluttered.
- Have it remember vendors/ data entered.