

# Usability Testing for the Consumer Expenditure Survey Electronic Diary

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**Brandon Kopp**

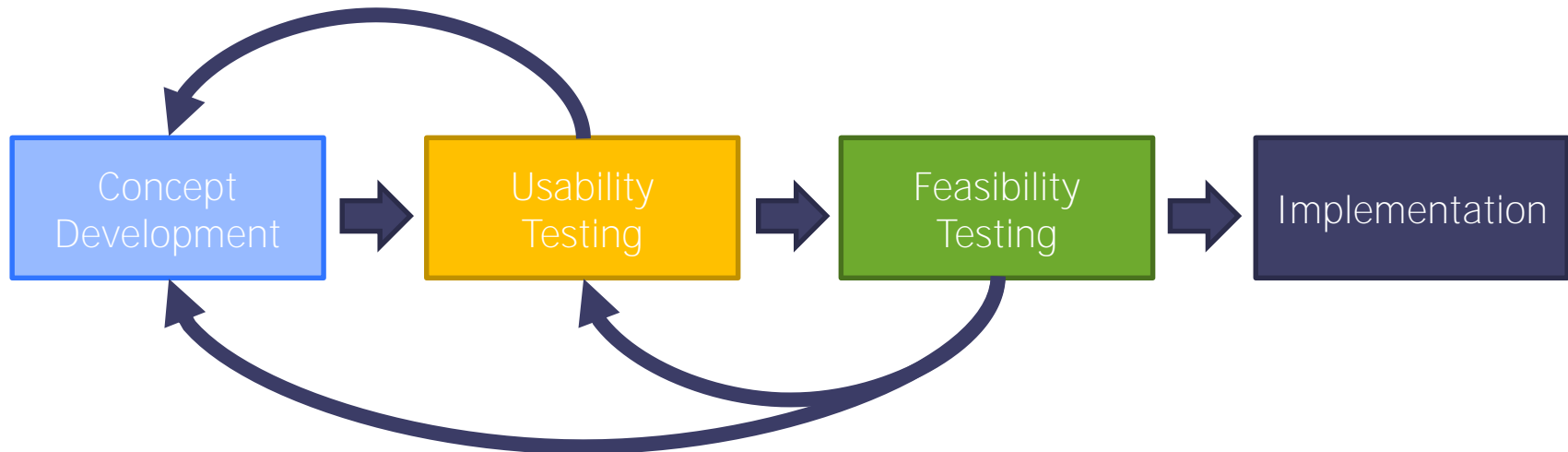
CE Symposium  
July 14, 2015



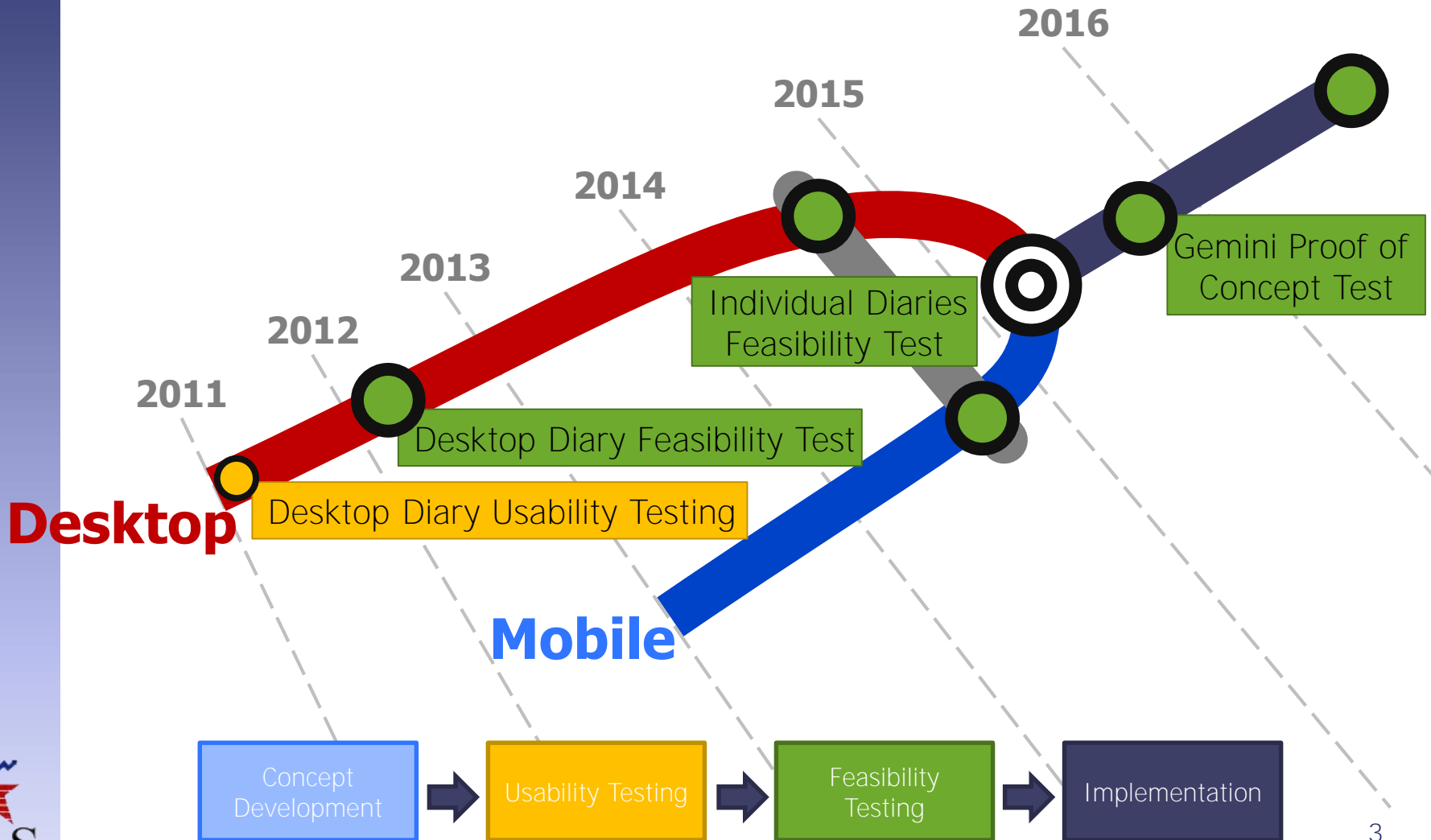
[www.bls.gov](http://www.bls.gov)

# The Design Process

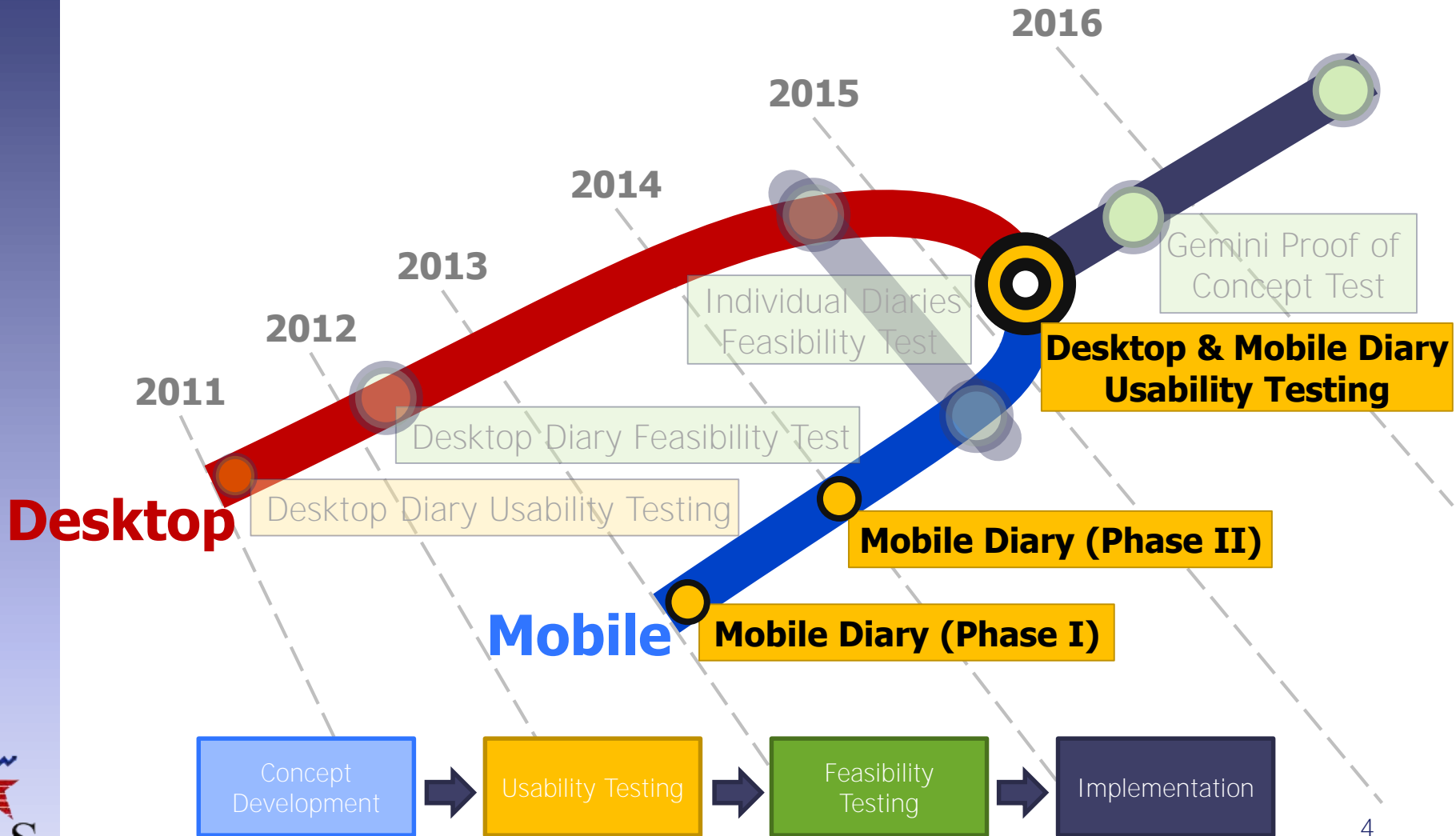
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# Timeline



# Timeline

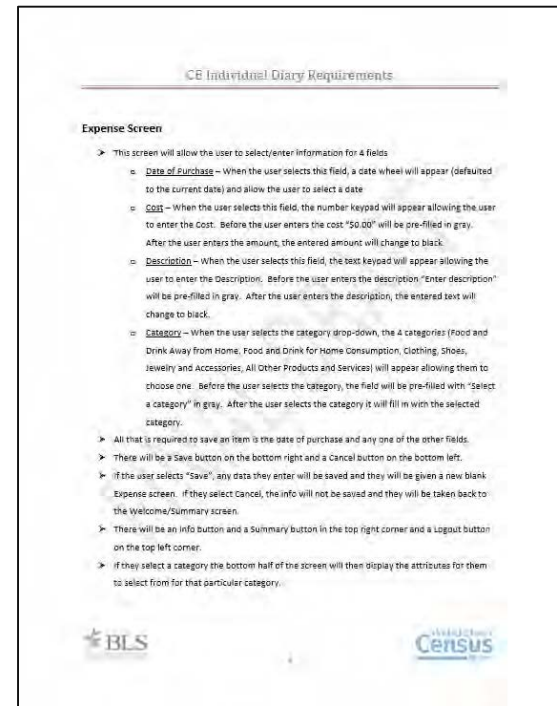
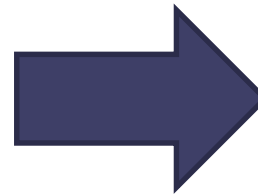
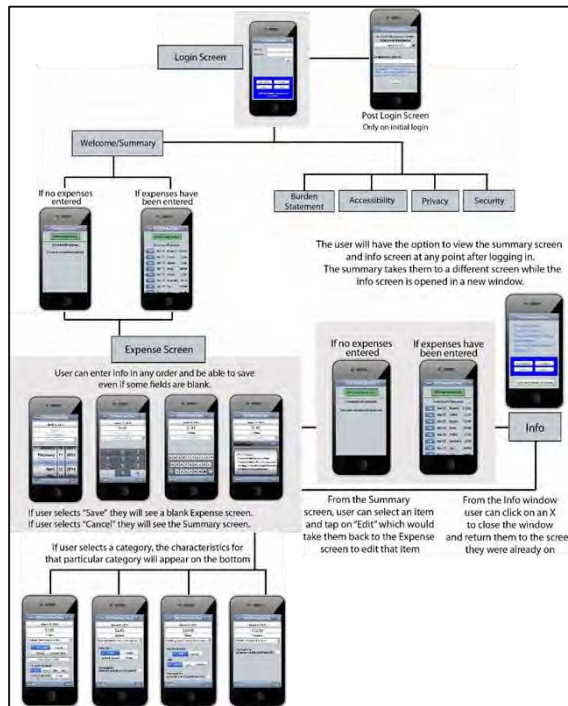


# Concept Development

Early Ideas

*become*

Requirements & Specifications



# Mobile Diary Phase I

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- Get feedback on initial design
- Test on wireframe instrument



Progress: 10/14 Exit Session

Please follow the experimenter's instructions.

Start Task



GenericMonitor

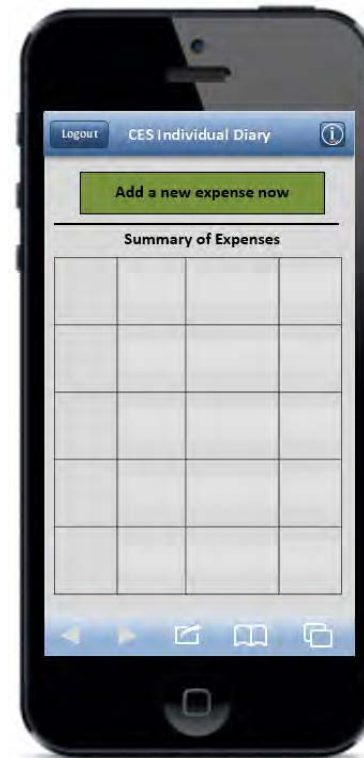
# Mobile Diary (Phase I) Materials



Login



Initial Setup



Home Screen



# Mobile Diary (Phase I) Materials



General Data Entry



Food and Drink  
Away From Home



Food and Drink For  
Home Consumption



Clothing, Shoes  
Jewelry, &  
Accessories



All Other Products &  
Services

# Mobile Diary (Phase I)

## Methods

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- 10 Participants
  - ▶ 3 with "A Moderate Amount" of smartphone experience
  - ▶ 7 with "A Lot" of experience
- 14 tasks that covered the basic operations a respondent would be expected to perform
  - ▶ Logging in, performing setup, navigation (X 3)
  - ▶ Entering expenditure data (X 8)
  - ▶ Editing/deleting data (X 3)

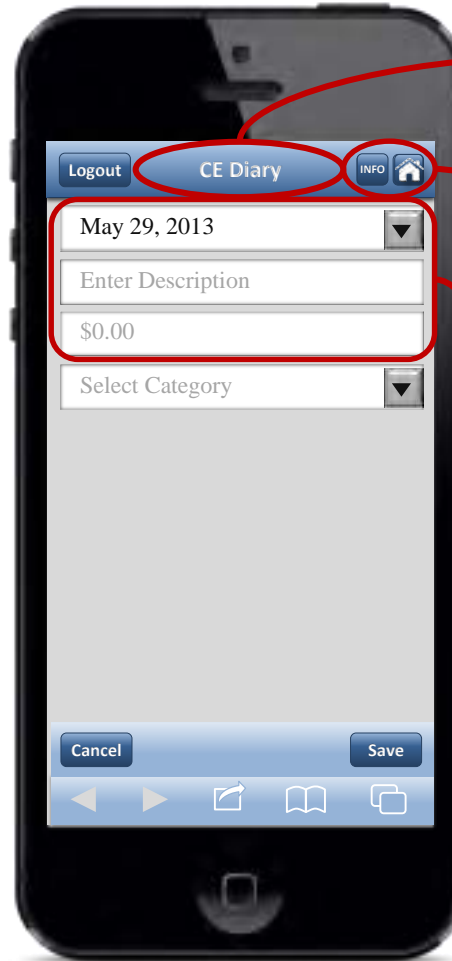
# Mobile Diary (Phase I) Results

Task Name	N	Percent Successful
<b>Initial Setup</b>		
Login	10	90%
Start Date	10	100%
Info Screen	10	<b>50%</b>
<b>Data Entry</b>		
Own Non-Food Purchase	10	70%
Clothing	10	70%
Other Cleaners	10	100%
Food Away	10	80%
Other DVD	10	90%
Own Food Purchase	10	70%
Grocery List	10	<b>50%</b>
Other Bill	10	100%
<b>Data Editing</b>		
Edit Price	10	90%
Delete Item	10	90%
Edit Date	10	90%

# Mobile Diary (Phase I)

## Recommendations

- 12 recommendations
- Make minor instrument changes
- Allow users to set their own password
- Emphasize placement procedures in Phase II testing



Simplify title

Replace buttons with something more descriptive



Left-align text boxes for uniform look

# Mobile Diary (Phase II)

- Took place five months after Phase I
- Used functional prototype instrument
- Participants used their own smartphone



# Mobile Diary (Phase II) Materials



CE Diary

User ID:

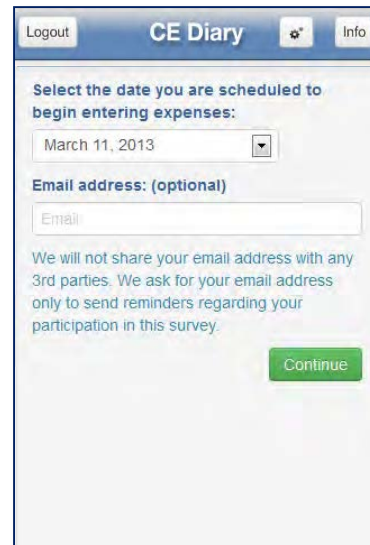
Password:

[Forgot password?](#)

OMB No.: 1220-0050  
Approval Expires: 4/30/2014

\*\* WARNING \*\*  
You have accessed a UNITED STATES GOVERNMENT computer. Use of this computer without authorization or for purposes for which authorization has not been extended is a violation of Federal law and can be punished with fines or imprisonment.

Login



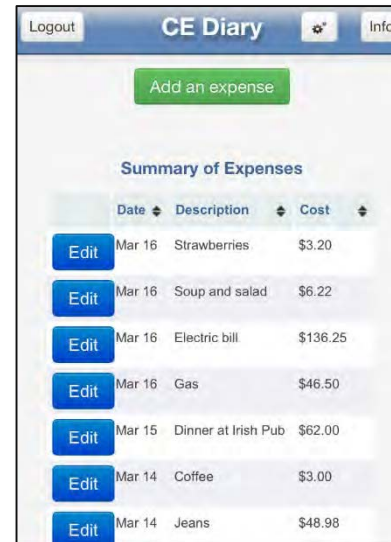
Logout CE Diary Info

Select the date you are scheduled to begin entering expenses:

Email address: (optional)

We will not share your email address with any 3rd parties. We ask for your email address only to send reminders regarding your participation in this survey.

Initial Setup

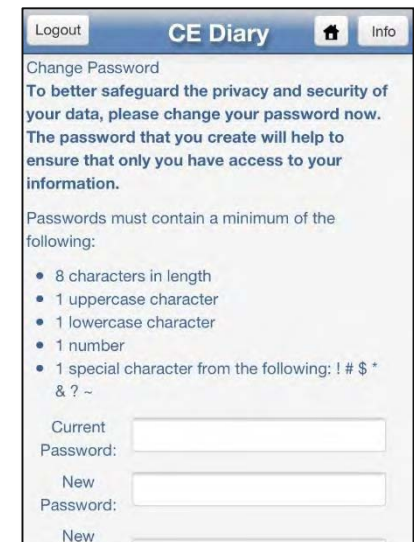


Logout CE Diary Info

Summary of Expenses

Date	Description	Cost
<input type="button" value="Edit"/>	Mar 16 Strawberries	\$3.20
<input type="button" value="Edit"/>	Mar 16 Soup and salad	\$6.22
<input type="button" value="Edit"/>	Mar 16 Electric bill	\$136.25
<input type="button" value="Edit"/>	Mar 16 Gas	\$46.50
<input type="button" value="Edit"/>	Mar 15 Dinner at Irish Pub	\$62.00
<input type="button" value="Edit"/>	Mar 14 Coffee	\$3.00
<input type="button" value="Edit"/>	Mar 14 Jeans	\$48.98

Home Screen



Logout CE Diary Info

Change Password

To better safeguard the privacy and security of your data, please change your password now. The password that you create will help to ensure that only you have access to your information.

Passwords must contain a minimum of the following:

- 8 characters in length
- 1 uppercase character
- 1 lowercase character
- 1 number
- 1 special character from the following: ! # \$ \* & ? ~

Current Password:

New Password:

New Password:

Change Password Screen

# Mobile Diary (Phase II) Materials

Logout CE Diary Info

March 16, 2013

Enter Description

\$0.00

Select Category

Cancel Save

General Data Entry

Logout CE Diary Info

March 14, 2013

Enter Description

\$0.00

Food and Drink Away from Home

Breakfast Lunch

Dinner Snack/Other

Select Type of Vendor

Alcohol Included?

Wine Beer Other

Cost of Alcohol:

\$0.00

Cancel Save

Food and Drink  
Away From Home

Logout CE Diary Info

March 14, 2013

Enter Description

\$0.00

Food and Drink for Home Consump

Is this item:

Fresh Frozen

Bottled/Canned Other

Purchased for someone outside your household

Cancel Save

Food and Drink For  
Home Consumption

Logout CE Diary Info

March 14, 2013

Enter Description

\$0.00

Clothing, Shoes, Jewelry, and Acces

Was the item for:

Male Female

Age:

Under 2 2-15 16 & Over

Purchased for someone outside your household

Cancel Save

Clothing, Shoes  
Jewelry, &  
Accessories

Logout CE Diary Info

March 14, 2013

Enter Description

\$0.00

All Other Products and Services

Purchased for someone outside your household

Cancel Save

All Other Products &  
Services

# Mobile Diary (Phase II) Methods

- 29 Participants
  - ▶ Screened by operating system & smartphone experience
- 13 tasks were similar to Phase I
- New, change password task
- Emphasized diary placement instructions



VAL MART		
FALLS CHURCH, VA 23156 - 703.893-8934		
10/25/13 06:09 PM		
		
037121340	SHAMPOO	2.94
037121345	CONDITIONER	2.94
063022838	PAPER TOWELS	11.99
073965782	LAUNDRY DETERGENT	18.99
267198321	VM WHOLE MILK	3.29
267896453	VM EGGS	2.69
298631456	STRAWBERRIES	2.99
225564861	OREOS	3.49
986945631	6-PK SOCKS	7.99
256971531	SZ 3 DIAPERS	41.99
	SUBTOTAL	99.30
	VA TAX 5.0%	4.97
	TOTAL	104.27
SIGN UP FOR A VALUMART CARD AND SAVE 5% ON EVERY PURCHASE!		



# Mobile Diary (Phase II)

## Placement Instructions

- Walked through pamphlet with participants
  - ▶ Discussed navigation
  - ▶ Emphasized itemization of entries
  - ▶ Discussed categories and data needs for each

**Getting Started**

Enter the provided User ID and Password

You will be given the option to set a personalized password. Use a password that you can easily remember!

Tap on the **INFO** button to learn more about the CE Survey

Your scheduled start date can be found on the front of this pamphlet

Enter your e-mail address to receive reminders to add your expenses

This is your Home Screen

To add an expense, tap on **ADD A NEW EXPENSE**

After you've added an expense, you will see it listed here. At any point in the diary, you can tap on the **INFO** button to return to this screen to see a summary of your entered expenses.

To view, edit, or delete any of your recorded expenses tap on **EDIT** next to that expense.

Date	Description	Cost
Oct 26	pasto dinner	\$32.76
Oct 26	drinks at bar	\$14.85
Oct 27	bus fare	\$1.25
Oct 27	meal	\$61.99
Oct 27	shirt	\$34.99
Oct 27	Ultimate takeout	\$26.68
Oct 27	electric bill	\$120.89
Oct 28	bus fare	\$1.25
Oct 28	dry cleaning	\$29.95
Oct 28	laundry	\$48.28
Oct 28	coffee	\$2.50

**Food and Drink Away from Home**

Select the date of the purchase

Enter the cost of the meal including tax

Select the category

Select the type of vendor

Indicate if alcohol was included (mark all that apply)

Describe the meal (e.g. coffee, buffet, drinks from cash bar, sandwich & chips)

Select the type of meal

Select the type of vendor

Enter the total cost of the alcohol

**Food and Drink for Home Consumption**

Select the date of the purchase

Enter the cost of the item without tax

Select the type of packaging

Describe the item (e.g. whole milk, eggs, cereal, bananas, case of beer)

Select the category

Check if purchased for someone outside your household

**Clothing, Shoes, Jewelry, and Accessories**

Select the date of the purchase

Enter the cost of the item without tax

Select the gender for whom the item was purchased for

Select the age range for whom the item was purchased for

Describe the item (e.g. jeans, soccer cleats, ring, baseball cap)

Select the category

Check if purchased for someone outside your household

**All Other Products and Services**

Select the date of the purchase

Enter the cost of the item without tax

Select the category

Check if purchased for someone outside your household

Describe the item (e.g. electric bill, dry cleaning, auto reg, DVD, car insurance)

Select the category

# Mobile Diary (Phase II) Results

Task Name	N	Percent Successful
<b>Initial Setup</b>		
Navigate & Login	28	<b>46%</b>
Start Date	28	96%
Set Personalized Password	9	<b>33%</b>
<b>Data Entry</b>		
Own Food Purchase	25	80%
Book for Friend, Jeans for Self	24	63%
Enter Car Insurance Bill	22	95%
Own Non-Food Purchase	28	93%
Dinner, Movie	26	<b>35%</b>
Drinks	25	<b>48%</b>
Long Receipt	22	<b>27%</b>
<b>Data Editing</b>		
Delete Pants	21	90%
Change Book Details	18	100%
Edit Price	24	58%

# Mobile Diary (Phase II)

## Recommendations

- 22 recommended changes
  - ▶ 10 relating to the password change process
- Entering a field should bring up the optimal virtual keyboard
- Reformat change password screen to emphasize the requirements



# Desktop & Mobile Diary

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- The Desktop & Mobile Diary are now combined and can be accessed at the same URL
- Website formats the screen for the device being used
- Goals:
  - ▶ Conduct usability testing for the new Desktop Diary
  - ▶ See whether participants have difficulty switching back and forth between modes

# Desktop & Mobile Diary

## Desktop Diary Changes

### Desktop Diary (2013)

The screenshot shows the 'CONSUMER EXPENDITURE DIARY SURVEY' interface. At the top left is the 'United States Census Bureau' logo. The main header contains the survey title. Below the header is a navigation bar with links for 'Information', 'User Guide', 'User Settings', and 'Logout'. A green banner reads 'Add an Expense'. The form fields include: 'Date' (January 8, 2015), 'Description' (6 pack socks), 'Cost' (\$7.99), and 'Category' (Clothing, Shoes, Jewelry, and Accessories). Below these are fields for 'Was the item for:' (Female), 'Age:' (16 & Over), and a checkbox for 'Purchased for someone outside your household'. A blue 'Save' button is to the right. A dark blue banner below the form reads 'Summary of Expenses'. The main content area is empty, displaying the message 'You have no entered expenses.'

# Desktop & Mobile Diary

## Mobile Diary Changes

Mobile Diary (2013)

The 2013 Mobile Diary app interface shows a mobile browser view of the CE Diary form. At the top, there is a status bar with a lock icon and the text "Enter Date". Below this is a browser address bar showing "respond.census.gov/cec" and a search button. The app's navigation bar includes a "Logout" button, the "CE Diary" title, a home icon, and an "Info" button. The main form area contains a date dropdown menu set to "July 15, 2014", a text input field for "Enter Description", a text input field for "\$0.00", a checkbox labeled "Recorded for another household member" which is unchecked, and a dropdown menu for "Food and Drink Away from Home". At the bottom, there are "Cancel" and "Save" buttons.

Mobile Diary (2015)

The 2015 Mobile Diary app interface shows a mobile browser view of the CE Diary form. At the top, there is a status bar with a lock icon and the text "Enter Date". Below this is a browser address bar showing "respond.census.gov/cec" and a search button. The app's navigation bar includes a "Logout" button, the "CE Diary" title, a home icon, and an "Info" button. The main form area contains a date dropdown menu set to "January 8, 2015", a text input field for "Enter Description", a text input field for "\$0.00", and a dropdown menu for "Food and Drink Away from Home". At the bottom, there are "Cancel" and "Save" buttons.

# Desktop & Mobile Diary Materials

## Desktop

The desktop interface features a blue header with the United States Census Bureau logo and the title "CONSUMER EXPENDITURE DIARY SURVEY". Below the header is a navigation bar with links for "Information", "User Guide", "User Settings", and "Logout". A green bar highlights the "Add an Expense" section. The form includes fields for "Date" (January 8, 2015), "Description" (6 pack socks), "Cost" (\$7.99), and "Category" (Clothing, Shoes, Jewelry, and Accessories). There is also a "Save" button. Below the form, a "Summary of Expenses" section shows "You have no entered expenses."

Date	Description	Cost	Category
January 8, 2015	6 pack socks	\$7.99	Clothing, Shoes, Jewelry, and Accessories

Was the item for:  Male  Female    Age:  16 & Under  16 & Over     Purchased for someone outside your household

## Mobile

The mobile interface is designed for a smaller screen. It features a search bar at the top with the URL "respond.census.gov/ce" and a "Search" button. Below the search bar is a navigation bar with "Logout", "CE Diary", a home icon, and "Info". The form includes a date selector (January 8, 2015), a description field (Enter Description), a cost field (\$0.00), and a category dropdown (Food and Drink Away from Home). At the bottom, there are "Cancel" and "Save" buttons.

# Desktop & Mobile Diary Methods

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- 20 participants
- Screened to have at least some experience with both a smartphone and a computer
- Used their own smartphone for Mobile and lab computer for Desktop



# Desktop & Mobile Diary Methods

- Participants received placement instructions emphasizing data requirements for diary
- Used an early version of the User Guide that will be used in the POC test

May 2015  
CE-FLD 10283-4

## USER GUIDE CE Web Diary

**Thank you** for agreeing to participate in the Consumer Expenditure Survey (CE). We understand that this task takes time; however, your information is very important to us and will be used for many purposes that affect all Americans. Among the most important, it is used to help calculate the Consumer Price Index, or CPI, which is a basic measure of the rate of inflation. For more information about the survey, visit <http://www.bls.gov/respondents/cev/>.


By law (Title 13, U.S. Code), we must keep your information confidential; we use it for statistical purposes only. If you have comments regarding this survey, please send them to: Division of Consumer Expenditure Survey, 2 Massachusetts Avenue N.E., Room 3985, Washington, DC 20212.

**Login to your CE Web Diary at <https://respond.census.gov/npc>**

### Username and Password

Logging in to the diary requires a unique and secure username that is assigned to each eligible member in your household. For security reasons, your password is provided separately by your Field Representative.

Respondent Name: \_\_\_\_\_  
Username: \_\_\_\_\_ Line Number: \_\_\_\_\_  
Start Date: \_\_\_\_\_ End Date: \_\_\_\_\_



**Note:** It may be helpful to create a shortcut from your computer desktop or home screen. This will make it easier to access your diary each day as you are entering expenses. See the instructions on the back of this user guide for how to create a shortcut.

### Questions?

Field Representative's name: \_\_\_\_\_ Telephone: \_\_\_\_\_

CE Help Desk: 1 (888) 211-5938 (Monday-Friday 8am-4pm EDT)  
NPC.CE.POC.Helpdesk@census.gov

U.S. Department of Commerce  
Economic and Statistics Administration  
U.S. CENSUS BUREAU  
census.gov

United States  
**Census**  
Bureau

# Desktop & Mobile Diary Tasks

	Task Name	Task Description	Group 1	Group 2
1.	Navigate to Website and Log In	Setup	Mobile	Desktop
2.	Set Start Date	Setup	Mobile	Desktop
3.	Enter Own Non-Food Purchase	Data Entry	Mobile	Desktop
<b>Device Change</b>				
4.	Navigate to Website and Log In	Setup	Desktop	Mobile
5.	Enter Own Food Purchase	Data Entry	Desktop	Mobile
6.	Enter Book for Friend, Clothes for Self	Data Entry	Desktop	Mobile
7.	Enter Dinner, Movie	Data Entry	Desktop	Mobile
8.	Enter Car Insurance	Data Entry	Desktop	Mobile
9.	Change Book Details	Editing	Desktop	Mobile
<b>Device Change</b>				
10.	Delete Pants	Editing	Mobile	Desktop
11.	Enter Shoes	Data Entry	Mobile	Desktop
12.	Enter Five Items	Data Entry	Mobile	Desktop
13.	Enter Food Away Expense	Data Entry	Mobile	Desktop
<b>Device Change</b>				
14.	Enter Seven Items	Data Entry	Choice	Choice

# Desktop & Mobile Diary Results

Task Name	N	Mobile % Successful	Desktop % Successful
Initial Setup			
Navigate & Login	20	90%	80%
Start Date	20	90%	100%
Navigate & Login	20	<b>60%</b>	100%

- Several participants had trouble navigating to the site
- Only one participant was unable to enter the username and password
  - ▶ This participant was not skilled with using a smartphone

# Desktop & Mobile Diary Results

Task Name	N	Mobile % Successful	Desktop % Successful
<b>Data Entry</b>			
Own Non-Food Purchase	20	73%	100%
Own Food Purchase	20	75%	83%
Book For Friend, Clothes For Self	20	<b>63%</b>	<b>58%</b>
Dinner, Movie	20	<b>38%</b>	<b>67%</b>
Car Insurance Bill	20	88%	100%
Shoes	19	100%	78%
5-Item Receipt	19	<b>70%</b>	<b>67%</b>
Coffee Shop	19	<b>60%</b>	<b>56%</b>
7-Item Receipt	18	100%*	<b>59%</b>

- 42 of the 51 issues were with data requirements and not with data entry
- The remaining issues were due to design

# Desktop & Mobile Diary Results

Task Name	N	Mobile % Successful	Desktop % Successful
Data Editing			
Change Book Details	18	88%	73%
Delete Pants	19	90%	<b>67%</b>


- One person was unable to find the delete button in the Desktop Diary
  - ▶ Several others took an extended time to find it

# Desktop & Mobile Diary Recommendations

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- Total of 33 recommendations
  - ▶ Most for the Desktop Diary
  - ▶ Almost all have been made leading up to POC
- Use an easy to type URL (e.g., [cediary.gov](http://cediary.gov)) to redirect people to the CE Diary

# Desktop & Mobile Diary Recommendations

 **CONSUMER EXPENDITURE DIARY SURVEY**

[Information](#) [User Guide](#) [User Settings](#) [Logout](#)

**Enter Your Expense Below**

Date	Description	Cost	Category
February 11, 2014	Enter Description	\$0.00	Clothing, Shoes, Jewelry, and Accessories

Was this item for:  Age:   Purchased for someone outside your household

**Summary of Expenses**

<input type="button" value="Cancel"/> <input type="button" value="Save"/>	Date	Description	Cost	Category
	February 09, 2014	Tennis Shoes	\$120.00	Clothing, Shoes, Jewelry, and Acc
<input type="button" value="Delete"/> <input type="button" value="Edit"/>	February 07	Strawberries	\$4.20	Food and Drink for Home Consumption

# Going Forward

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- Contract with Westat to conduct the Electronic Desktop Diary Design Improvements (ED3I)
  - ▶ Propose alternative designs
  - ▶ Usability test two of those designs
  - ▶ Provide recommendations for future
- Work with Census to review and usability test alternative login requirements
  - ▶ 7-Digit PIN as Password
  - ▶ Other feasible alternatives



# Contact Information

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## Brandon Kopp

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